



Private Ordering and Corporate Governance: The Case of Venture Capital

Citation

Pavlos Masouros, Private Ordering and Corporate Governance: The Case of Venture Capital (2009).

Permanent link

<http://nrs.harvard.edu/urn-3:HUL.InstRepos:3450554>

Terms of Use

This article was downloaded from Harvard University's DASH repository, and is made available under the terms and conditions applicable to Other Posted Material, as set forth at <http://nrs.harvard.edu/urn-3:HUL.InstRepos:dash.current.terms-of-use#LAA>

Share Your Story

The Harvard community has made this article openly available.
Please share how this access benefits you. [Submit a story](#).

[Accessibility](#)

Private Ordering and Corporate Governance: The Case of Venture Capital

Pavlos Masouros*

In a private company setting corporate governance institutions can be viewed as responses to the contractual challenges of moral hazard, adverse selection and incompleteness of contracts. Thereupon, the attributes of corporate governance mechanisms are structured in a way that allows the corporate constituencies to deal with contractual design exigencies. Contract theory is thus a determinant of corporate governance.

VC-backed firms provide an explicit manifestation of this philosophy of design of corporate governance institutions. The financing practices that VC firms implement and the securities that they hold are carefully designed so as to allow the members of the firm to surmount the contractual obstacles. Staged investment (or staggered financing) is a screening mechanism that induces entrepreneurs to signal their intrinsic motivation to the VC firm and thus allows the latter to tackle the adverse selection problem. Convertible preferred stock, the VCs' investing vehicle of choice, allows the establishment of an incentive-compatible income stream, as it replicates the disciplining and agency cost-mitigating effects of paradigm debt while at the same time it eliminates the foremost agency cost of paradigm debt, the "asset substitution effect". Consequently, with the "debilike" security of convertible preferred stock VCs can cope efficiently with the problem of moral hazard. In addition to this, the typical covenants that are embedded in convertible preferred stock help to generate an optimal state-contingent allocation of control rights between the VC and the entrepreneur that is in alignment with the basic axioms of financial contracting theory. Thereupon, convertible preferred stock serves as a corporate governance mechanism that challenges the problem of the incompleteness of contracts.

Finally, given that the design of efficient corporate governance institutions in a VC setting requires a great deal of contracting flexibility, we look at the mandatory nature of European corporate laws and seek to ascertain whether they directly impede VC contracting. Although no such evidence is found, it is argued that the overall mandatory nature of European corporate laws compromises the contract innovation capacity of European lawyers, who, paralyzed by anchoring bias, do not invest in learning sophisticated VC financial and corporate governance design techniques that would let the VC industry in Europe flourish.

* LL.M. Candidate in Corporate Law & Governance, Harvard Law School, Cambridge, Mass.

Table of Contents

Introduction.....	4
I. The Contractarian Theory of the Firm and Corporate Governance	8
A. The departure from the neoclassical theory of the firm and the “nexus of contracts” approach.....	8
B. Transaction-Cost Economics, Incomplete Contracting and the Need for Corporate Governance	13
C. The Dimensions of the Lato Sensu Incompleteness of Contracts as Determinants of Corporate Governance	16
1. <i>Moral Hazard Costs and Post-Contractual Opportunism</i>	16
2. <i>Adverse Selection</i>	20
3. <i>Stricto Sensu Incompleteness of Contracts</i>	21
II. Screening Private Information: How VCs Deal With Adverse Selection.....	24
A. The Theory of Financial Intermediation and Venture Capital	24
B. The Staged Investment of Venture Capital	29
1. <i>Integrating Governance Design into the Screening Game</i>	29
2. <i>Real Options Theory and Staged Investment</i>	32
3. <i>Staged Investment as a Screening Strategy</i>	34

i. <i>The traditional view of staged financing as a monitoring device</i>	34
ii. <i>A behavioral approach to staged investment: Looking for entrepreneurial intrinsic motivation</i>	35
iii. <i>The problem of "soft-budget constraints"</i>	37
iv. <i>The VC partnership agreement as a hard budget constraint</i>	40
III. <i>Infusing Governance through Security Design: Why Convertible Preferred Stock?</i> .	42
A. <i>Venture Capital's Investing Vehicle of Choice: Convertible Preferred Stock</i>	42
1. <i>Dividend and Liquidation Preference</i>	44
2. <i>Redemption Rights</i>	46
3. <i>Convertibility</i>	47
4. <i>Control Rights</i>	50
B. <i>The Theories of Capital Structure and their Application in VC Financing: Governance Features of Convertible Preferred Stock I</i>	51
1. <i>Solving the Enigma of Convertible Preferred; Standardization, Mimetic Isomorphism and Corporate Governance</i>	51
2. <i>The Modigliani-Miller Capital Structure Irrelevance Theorem and the Rise of the Capital Structure Debate</i>	53
3. <i>Taxation and Capital Structure Choice; The Tax Effects of Convertible Preferred Stock in VC-backed firms</i>	57

4. Capital Structure as an Agency Cost-Mitigating Mechanism	61
i. The disciplining effects of debt	61
ii. Replicating the incentive-compatible cash flow structure of debt with convertible preferred stock; Placing convertible preferred on the debt-equity continuum.....	63
5. Capital Structure as a Signaling Mechanism	71
i. Leverage signaling models	71
ii. Reversing the signaling game; Sorting out entrepreneurs by using convertible preferred stock	74
C. Financial Contracting Theory and its Application in VC Financings: Governance Features of Convertible Preferred Stock II	76
1. Advanced Security Design: Separating Cash Flow and Control Rights.....	76
2. Financial Contracting Theory and the State-Contingent Optimal Allocation of Control Rights	79
3. Optimal Programming of the Control Rights Pendulum in VC Contracts	83
IV. The Mandatory Model of Corporate Law in Europe and its Implications for Venture Capital	88
A. Comparing the US and the European VC Industry	88
B. The Enabling Character of US Corporate Law versus the Mandatory Nature of European Corporate Law	93

C. Does the Mandatory Nature of European Corporate Laws Directly Impede VC Contracting?	96
D. Contractual Path Dependence and Mandatory Corporate Law	98
V. Conclusion	101

Introduction

Since the turn of the century and the Enron-class corporate scandals the debate on corporate governance has been shaped by a massive complex of realized or contemplated legal reforms. The introduction of the Sarbanes-Oxley Act in 2002, the proposed amendments to the proxy rules regarding shareholder access and lately the proposed regulations pertaining to executive compensation have all led to a unidirectional view of corporate governance emanating from state actors and imposed upon corporations. This top-down perspective has shifted the focus away from the plethora of corporate governance institutions that do not stem from state or federal law, but are privately designed by the corporate constituencies and are legitimized through their inclusion in the firm's charter or bylaws. To put it differently, now that the Congress and the SEC have started interfering more with internal corporate affairs the study of the contribution of private ordering to the US corporate governance system is to a certain extent put aside in the corporate law literature.

This paper seeks to rejuvenate the interest in private corporate governance institutions by attempting to reconcile corporate governance with contract theory. The underlying theme of the paper is that the comprehension of the factors that shape corporate governance in a private company setting presupposes the comprehension of the

factors that impact contract design. In reality, many of the governance mechanisms that are designed by the parties to the corporate contract are essentially devices used to mitigate the various contractual impasses that contract theory identifies. The features of the contractual problems of adverse selection, moral hazard and incompleteness actually act as determinants of corporate governance planning. In other words, corporate governance institutions are a response to contractual design exigencies. Without corporate governance the members of the firm would have no way to fend off the cognitive chaos that derives from the problems of hidden knowledge, hidden action and unanticipated contingencies, to which the corporate contract gives rise.

To illustrate this argument I use the example of venture capital, where start-up firms and venture capitalists, acting within the scope of the enabling regime of state corporate law and free of the burdens of federal securities regulation or listing standards, draft their financial contract in a way that allows an optimal corporate governance structure to be established in the venture-backed firm. In Parts II and III of the paper I show step-by-step how the venture capital financial contract is designed in order to put in place governance tools that will help the parties surmount the three basic problems of contracting.

In Part I of the paper I explain the contractarian foundations of the firm by using concepts of agency theory and transaction-cost economics. I introduce the term “*lato sensu* incompleteness of contracts”, which includes not only the traditional (*stricto sensu*) incompleteness of contracts, namely the fact that the parties to a contract cannot foresee all future contingencies, but also the two other major contractual problems of moral hazard and adverse selection. I, then, present my main argument that corporate

governance mechanisms in a private company setting are actually devices, with which corporate constituencies try to tackle this three-dimensional *lato sensu* incompleteness of contracts, so that a private firm's governance structure will reflect the severity and peculiarities of this contractual challenge.

In Part II I present the strategies employed by venture capitalists to deal with the problem of adverse selection. I argue that, although staged investment is viewed by the majority of the venture capital literature as a monitoring device, it should also be viewed as a screening mechanism; a corporate governance institution that helps the venture capitalist respond to the pooling problem. To substantiate my argument I use concepts of behavioral labor economics and I show how staged investment can lead the entrepreneurs to signal their intrinsic motivation to the venture capitalist. As a side issue, I examine how the venture capital fund partnership agreement allows the venture capitalist to credibly commit to a staged investment, which because of the “soft-budget constraints syndrome” other financial intermediaries cannot do.

In Part III I demonstrate the significance of security design for a firm's corporate governance structure by using the example of convertible preferred stock, which is the investing vehicle of choice of venture capitalists in the US. I postulate that convertible preferred stock should not be viewed as a mere financial instrument, but as a self-sufficient corporate governance institution. Using a novel technique established by Moody's for the evaluation of hybrid securities, I prove that with convertible preferred stock venture capitalists can create a “debtlike” payoff structure that can replicate the disciplining effects that debt has according to the theories of capital structure. I also show that convertible preferred stock is even superior to paradigm debt for the financing of

start-up firms, because it preserves debt's beneficial incentivizing features, but also helps the venture capitalist avoid the harmful "asset substitution effect" that pure debt might create. While these two elements prove that convertible preferred stock is a governance device ideally designed by venture capitalists to deal with the problem of moral hazard, I also suggest that this corporate security can help them structure a complementary screening mechanism that will induce entrepreneurs to signal their confidence in the project. Finally, I demonstrate that the state-contingent allocation of control rights that is obtained through the proper design of convertible preferred stock is in alignment with the axioms of financial contracting theory and the contingent control model the latter puts forward. Thereupon, convertible preferred stock proves also to be an efficient governance tool to fend off against the third major contractual challenge, the *stricto sensu* incompleteness of contracts.

In Part IV, by relying on the conclusions derived from Parts II and III, I start my analysis with the premise that the design of optimal corporate governance institutions in venture-backed firms requires a great deal of contracting flexibility. I then pose the question of whether the inferior performance of the venture capital industry in Europe could be attributed partially to the mandatory nature of European corporate laws that do not allow for such a great flexibility. By looking at several European corporate statutes and by examining empirical data of venture capital financings in Europe I conclude that there are no specific prohibitions for European venture capitalists to privately design US-style tools for the financing of a start-up firm. However, I argue that the general mandatory character of European corporate laws leads law firms to underinvest in contract innovation, which is an indispensable element of success of venture capital

financing. The general rigidity of European corporate laws creates what behavioral psychology refers to as anchoring bias, which deters lawyers in Europe from being innovative and from expending costs to learn how to use the financially optimal instrument of convertible preferred stock. This results in less expertise in the design of contracts, which might in turn lead to suboptimal corporate governance structures in venture-backed firms. Creating the conditions for lawyers to be innovative when drafting financial contracts optimizes the contribution of private ordering to corporate governance.

Part V briefly concludes.

I. The Contractarian Theory of the Firm and Corporate Governance

A. The departure from the neoclassical theory of the firm and the “nexus of contracts” approach

For the greatest part of the 20th century most of the academic literature produced in the field of the theory of organizations was influenced by the neoclassical conception of exchange, as it was established by the Walrasian exchange theory¹. Based on this model of exchange, the firm was represented by a production function, which specified the level of output that is obtained when given levels of inputs are chosen². The production opportunity set available to the firm was defined in terms of its boundary; what is the maximum obtainable output quantity for different levels of input quantities,

¹ See LEON VALRAS, ELEMENTS OF PURE ECONOMICS (W. Jaffe, trans.) (1954), pts. I-III; KNUT WICKSELL, LECTURES ON POLITICAL ECONOMY, vol. 1, pt. 1

² ANDREU MAS-COLELL ET AL., MICROECONOMIC THEORY (1995), ch.5

given the state of technology and knowledge³? Within the neoclassical paradigm the firm was viewed as a “black box”⁴, where everything operates smoothly and efficiently, while the internal decision making machinery was not explicated⁵. Despite the fact that there had been some critical approaches to this view of the firm⁶, the vast majority of economists insisted on portraying the firm as implicitly marginalistic⁷ and they focused exclusively on how firms make the optimal production choices. In a perfectly competitive market, the members of the firm would have the proper incentives for maximizing their utility levels and they would move towards profit maximization, which implies cost minimization. There was no worry about how the owners of the firm succeed in aligning the objectives of its various members. Incentive considerations that could arise from the assumption that the members of the firm have individually different objectives were not incorporated in the neoclassical model. Even authors who conducted research within the framework of the theory of teams and recognized the decentralized nature of information within a team postulated identical objective functions for the members of a firm⁸. This seemed to be a broader problem of the general equilibrium theory, which did not account for informational asymmetries and the full complexity of strategic interactions between privately informed agents⁹. At the same time, the neoclassical paradigm gave no

³ Michael Jensen & William Meckling, *Rights and Production Functions: An Application to Labor-Managed Firms and Codetermination*, 52 JOURNAL OF BUSINESS 469, 470

⁴ Jim Tomlinson, *Democracy Inside the Black Box? Neoclassical Theories of the Firm and Industrial Democracy I*, 15 ECONOMY AND SOCIETY 220, 220; see also Kenneth Arrow, *Foreword*, in FIRMS, MARKETS AND HIERARCHIES (G. CARROLL & D. TEECE eds., 1999), vii: “Any standard economic theory, not just neoclassical, starts from the existence of firms. Usually, the firm is a point or at any rate a black box”.

⁵ MARK BLAUG, *THE METHODOLOGY OF ECONOMICS- OR HOW ECONOMISTS EXPLAIN* (1992), 98

⁶ ROBERT HALL & CHARLES HITCH, *PRICE THEORY AND BUSINESS BEHAVIOR* (1939), 12-45

⁷ Ronald Edwards, *The Pricing of Manufactured Products*, 19 ECONOMICA, 298, 298; M. FRIEDMAN, *ESSAYS IN POSITIVE ECONOMICS* (1953), 21

⁸ See e.g. JACOB MARSCHAK & ROY RADNER, *ECONOMIC THEORY OF TEAMS* (1972)

⁹ BERNARD SALANIE, *THE ECONOMICS OF CONTRACTS: A PRIMER* (2005), 1-2

explanation why particular activities are organized within firms; in other words it did not pin down the boundaries of the firm, thus failing to explain differences in size and shape. With all these questions unanswered the time came to open the “black box” and examine the actual workings of the corporate mechanism inside¹⁰.

The question that the neoclassical theory of the firm left open with regard to the boundaries of the firm was addressed by Ronald Coase in his much celebrated paper *The Nature of the Firm*¹¹. Coase argued that outside the firm the price mechanism operates in all transactions, while within the firm operations are controlled by the direction of the entrepreneur. The range of transactions over which the price mechanism is replaced by the authority of an entrepreneur-coordinator constitutes the boundaries of the firm¹². Direction by the entrepreneur can be more efficient than using the price mechanism; in other words organizational costs can be lower than price mechanism costs and whenever this is the case, the firm structure will be preferred instead of contracting in the open market.

While Coase focused on the boundaries of the firm by emphasizing the role of authority in distinguishing it from what happens in the conventional market, another group of authors buckled down to the task of integrating incentive considerations in the theory of the firm. This new way to study the firm was the result of a general departure from the general equilibrium theory, which did not encompass asymmetric information and the potential for manipulation of private information that economic agents might

¹⁰ AVINASH DIXIT, *THE MAKING OF ECONOMIC POLICY* (1996), 9

¹¹ 16 *ECONOMICA*, 386

¹² Melvin Eisenberg, *The Conception that the Corporation Is a Nexus of Contracts, and the Dual Nature of the Firm*, 24 *JOURNAL OF CORPORATION LAW*, 819, 820

possess¹³. The starting point of these authors' analysis was the assumption that some of the inputs of the firm's production function may have a quality that is endogenous, rather than exogenous¹⁴. That means that the value of an input, which will affect the production output, may depend partially on the effort the manager expends, so that a key issue in every firm is how to provide the manager with the proper incentives to improve this quality. The reference to the matter of incentives linked the whole issue to the so-called "incentive theory"¹⁵, which analyzes the problem of delegating a task to an agent with private information¹⁶. Thus, the principal-agent model started to play a key role in the discourse about the theory of the firm. This model uses *the contract* governing the relationship between the principal and the agent as the unit of analysis for the firm¹⁷, thus departing from the neoclassical paradigm and the "authoritarian" Coasean approach¹⁸ and hence moving towards a contractarian approach.

Jensen and Meckling¹⁹ with the aid of the micro-analytical tools of contract theory²⁰ identified the separation of finance and management²¹ –already effectively

¹³ SALANIE, *supra* note 9, 2

¹⁴ OLIVER HART, FIRMS, CONTRACTS AND FINANCIAL STRUCTURE, (1995), 18

¹⁵ It seems that often the term "incentive theory" is used to refer to the discourse of the same issues, on which contract theory focuses. This could be attributed to the fact that contract theory is a relatively young discipline and thus does not enjoy the privilege of appearing under a consistent name; see Eric Brousseau & Jean-Michel Gachant, *The Economics of Contracts and the Renewal of Economics*, in THE ECONOMICS OF CONTRACTS: THEORIES AND APPLICATIONS (E. BROUSSEAU & J.-M. GACHANT eds., 2002), 3-6

¹⁶ Eric Maskin, *Roy Radner and Incentive Theory*, 6 REVIEW OF ECONOMIC DESIGN 311, 311

¹⁷ Kathleen Eisenhardt, *Agency Theory: An Assessment and Review*, 14 ACADEMY OF MANAGEMENT REVIEW 57, 59; However, Michael Jensen indicates that "the individual agent is the elementary unit of analysis" for agency theory, see Michael Jensen, *Organization Theory and Methodology*, 53 ACCOUNTING REVIEW 319, 327, but this indeed implicates the study of contracting.

¹⁸ For objections of the contractarians against the coercionist approach of Ronald Coase see Armen Alchian & Harold Demsetz, *Production, Information Costs and Economic Organization*, 62 AMERICAN ECONOMIC REVIEW 777

¹⁹ Michael Jensen & William Meckling, *The Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure*, 3 JOURNAL OF FINANCIAL ECONOMICS 305

²⁰ Jacques Lenoble, *From an Incentive to a Reflexive Approach to Corporate Governance*, in CORPORATE GOVERNANCE: AN INSTITUTIONALIST APPROACH (2003), 20

located by Berle and Means²²- as the essence of the agency problem of the firm and focused their efforts on developing the most efficient contract governing the financier-manager relationship given assumptions about people, organization and information²³. Under the contractarian approach, transactions within the firm and transactions outside the firm are part of a continuum of contractual relations²⁴. Therefore, the firm is not an arena for authority and direction as Coase postulated, but an arena for making contracts²⁵; a nexus for a set of contractual relationships²⁶. The term “contract”, however, in this context does not refer to the legal notion of contract, but has a much broader range of coverage²⁷; it refers to an economist’s view of the contract as any reciprocal institutional arrangement between two or more parties that influences and coordinates strategic interactions between the individual decision makers²⁸.

²¹ The more standard terminology is “separation of ownership and control” (*see e.g.* Eugene Fama & Michael Jensen, *Separation of Ownership and Control*, 26 JOURNAL OF LAW AND ECONOMICS 301), but in my view separation of finance and management conveys the agency problem better.

²² ADOLPH BERLE & GARDINER MEANS, *THE MODERN CORPORATION AND PRIVATE PROPERTY* (1932)

²³ The issue of incentives in management was touched upon explicitly almost fifty years before Jensen and Meckling developed the agency theory framework by Chester Barnard in his book *THE FUNCTIONS OF THE EXECUTIVE* (1938), 139: “An essential element of organizations is the willingness of persons to contribute their individual efforts to the cooperative system... Inadequate incentives mean dissolution or changes of organization purpose, or failure to cooperate. Hence, in all sorts of organizations the affording of adequate incentives becomes the most definitely emphasized task in their existence. It is probably in this aspect of executive work that failure is most pronounced”.

²⁴ Oliver Hart, *An Economist’s Perspective on the Theory of the Firm*, 89 COLUMBIA LAW REVIEW 1757, 1764

²⁵ Jeffrey Gordon, *The Mandatory Structure of Corporate Law*, 89 COLUMBIA LAW REVIEW 1549, 1549

²⁶ Eisenberg, *supra* note 12, 823

²⁷ YUWA WEI, *COMPARATIVE CORPORATE GOVERNANCE: A CHINESE PERSPECTIVE* (2003), 44

²⁸ Brousseau & Glachant, *supra* note 15, 3; URS SCHWEIZER, *VERTRAGSTHEORIE* (1999), 5. Especially, in the venture capital literature, to which we will turn shortly, the term “contract” is also very often used in its broad sense, as including not only explicit enforceable contractual provisions, but also implicit reciprocal arrangements; *see* Bernard Black & Ronald Gilson, *Venture Capital and the Structure of Capital Markets: Banks versus Stock Markets*, 47 JOURNAL OF FINANCIAL ECONOMICS 243, 261ff.; Ulrich Hege et al., *Determinants of Venture Capital Performance: Europe and the United States*, LSE Working Paper Nov. 2003, 2 available at <http://www.lse.ac.uk/collections/RICAFE/pdf/RICAFE-WP01-Hege.pdf>

As it will become evident in the following sections, the establishment of the contractarian approach to the firm is of great significance for the way we think (or *ought* to think) about corporate governance nowadays²⁹.

B. Transaction-Cost Economics, Incomplete Contracting and the Need for Corporate Governance

Despite the fact that it was Jensen and Meckling's paper that introduced the contractarian approach to the firm³⁰, the spread of the idea that the theory of the firm is an extension of the theory of contracts is customarily credited to a stream of economic thought known as "Transaction-Cost Economics", which includes the work of Oliver Williamson³¹, Oliver Hart³² and Benjamin Klein, Robert Crawford and Armen Alchian³³. These authors, starting with Coase's idea –despite the fact that Coase could be considered as an authoritarianist in terms of the theory of the firm³⁴– that there are transaction costs in writing a contract, postulated that parties to a relationship will fail to write a contract

²⁹ The contractarian approach to the firm is prevalent in the US corporate thought. Nonetheless, it does not seem to be a universal idea. In Germany, for instance, the German Constitutional Court (*Bundesverfassungsgericht*) has indirectly rejected the view of the firm as a nexus of contracts by explicitly recognizing the firm as a joint undertaking of labor and capital. According to this judicial opinion the economic view of the firm should be complemented with a social approach, which would conceive the firm as the joint undertaking of labor and capital ("*Diese ist der Preis der angestrebten Ergänzung der ökonomischen durch eine soziale Legitimation der Unternehmensleitung in größeren Unternehmen, der Kooperation und Integration aller im Unternehmen tätigen Kräfte, deren Kapitaleinsatz und Arbeit Voraussetzung der Existenz und der Wirksamkeit des Unternehmens ist*"); Entscheidungen des Bundesverfassungsgerichts Bd. 50, 290, 352.

³⁰ Lenoble, *supra* note 20, 20

³¹ OLIVER WILLIAMSON, *MARKETS AND HIERARCHIES: ANALYSIS AND ANTITRUST IMPLICATIONS* (1975); Oliver Williamson, *Transaction-Cost Economics: The Governance of Contractual Relations*, 22 JOURNAL OF LAW AND ECONOMICS 3; OLIVER WILLIAMSON, *THE ECONOMIC INSTITUTIONS OF CAPITALISM* (1985)

³² Oliver Hart, *Incomplete Contracts and the Theory of the Firm*, 4 JOURNAL OF LAW, ECONOMICS AND ORGANIZATION 119

³³ Benjamin Klein et al., *Vertical Integration, Appropriable Rents and the Competitive Contracting Process*, 21 JOURNAL OF LAW AND ECONOMICS 297

³⁴ Alice Belcher, *The Boundaries of the Firm: The Theories of Coase, Knight and Weitzman*, 17 LEGAL STUDIES 22, 22; *contra* Andrei Shleifer & Robert Vishny, *A Survey of Corporate Governance*, 52 JOURNAL OF FINANCE 737, 740

that anticipates all future contingencies. Given the behavioral economics axiom³⁵ that human agents are subject to a bounded rationality³⁶, which means that perfectly rational decisions are not feasible due to the finite computational resources available for making them³⁷, contracts will necessarily be incomplete. They will contain gaps or missing provisions, as rational actors must exercise judgment in a context of uncertainty³⁸ and some important future variables have to be left out of the contract, because they may be difficult or even impossible to predict or describe³⁹. Complete contingent contracts that specify obligations in each possible state of the world are impeded by the inherent transaction costs of contracting⁴⁰.

Building on Jensen and Meckling's view that the firm is a nexus of contracts, transaction-cost economics rendered the paradigm of incomplete contracting central in the way we reflect on the nature of the firm and its governance structure. As Luigi Zingales puts it:

Only in a world where some contracts contingent on future observable variables are costly (or impossible) to write ex-ante, is there room for governance ex-post. Only in such a world, are there quasi-rents that must be divided ex-post and real decisions that must be made ... only in

³⁵ Christine Jolls et al., *A Behavioral Approach to Law and Economics*, in BEHAVIORAL LAW & ECONOMICS (C. SUNSTEIN) (2000), 14

³⁶ "Bounded rationality" is a term attributed to Herbert Simon, who defines it as behavior that is "intendedly rational, but only limitedly so", see HERBERT SIMON, ADMINISTRATIVE BEHAVIOR (1961) p. xxxiv

³⁷ The cognitive assumption of bounded rationality on which transaction-cost economics rely is another pillar by which the theory of the firm put forward by this school of thought is distinguished by the neoclassical approach to the firm.

³⁸ Lenoble, *supra* note 20, 20

³⁹ Philippe Aghion & Patrick Bolton, *An Incomplete Contracts Approach to Financial Contracting*, 59 REVIEW OF ECONOMIC STUDIES 473, 473

⁴⁰ Robert Scott & George Triantis, *Incomplete Contracts and the Theory of Contract Design*, 56 CASE WESTERN RESERVE LAW REVIEW 187, 190

a world of incomplete contracts can we define what a firm is and discuss corporate governance.⁴¹

In other words, incomplete contracts are what give rise to the need for corporate governance⁴². Incomplete contracting acts as a determinant of corporate governance mechanisms, in the sense that the latter are a response to contractual design exigencies; they are devices used to mitigate contractual impasses⁴³ and to reduce the risks associated with incomplete knowledge. Understanding the factors that impact contract design means understanding the factors that shape corporate governance.

Although “incompleteness of contracts” has become a *terminus technicus* of contract theory conveying the impossibility of accommodating all future eventualities in a contract, I argue here that, when this term is used within the analytical framework of the theory of the firm, it should be given a broader meaning; it should be used so as to include all the implicit challenges of contracting between the financiers of the firm and the managers and not only the unforeseeability of future eventualities. “Incompleteness” should incorporate not only the problem of unpredictable future variables, but also the incentive problems, to which agency theory points, as well as additional contractual hazards that transaction-cost economics identifies. To make things clear, I will hence refer to contract theory’s traditional notion of incompleteness as “*stricto sensu* incompleteness” and to the sum of intrinsic problems that contracting between financiers and managers has as “*lato sensu* incompleteness”.

⁴¹ Luigi Zingales, *Corporate Governance in THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW* (P. NEWMAN ed., 1998) 497, 503

⁴² See Andrei Shleifer & Robert Vishny, *supra* note 34; Jean Tirole, *Corporate Governance*, 69 *ECONOMETRICA* 1

⁴³ Oliver Williamson, *The Theory of the Firm as Governance Structure: From Choice to Contract*, 16 *JOURNAL OF ECONOMIC PERSPECTIVES*, 171, 174

Under this terminological distinction, *stricto sensu* incompleteness will be treated merely as one of the many conundrums that the principal-agent contract must address; in other words as one of the dimensions of the *lato sensu* incompleteness of contracts.

The construction of this new term will also help me to convey more efficiently a significant point that I am trying to make in the following section: agency theory and transaction-cost economics although customarily considered as two distinct approaches to the theory of the firm are in essence complementary and the problems that they identify with regard to the contract, which underlies the organization of a firm, can be accommodated under a single broad sense of incompleteness.

C. The Dimensions of the Lato Sensu Incompleteness of Contracts as Determinants of Corporate Governance

1. Moral Hazard Costs and Post-Contractual Opportunism

If one skims treatises and articles listing the different theories that have been put forward to describe the nature of the firm, it won't be difficult to identify that transaction-cost economics and agency theory are traditionally classified as two distinct approaches to the theory of the firm⁴⁴. However, this taxonomy comes as a surprise, if one takes under account the contractarian basis of *both* schools of thought that we described above. The actual convergence of the two theories is more evident, if we also consider the main concerns that they express with regard to the organization within a firm.

Agency theory develops a theory of contracts in cases, which are characterized by asymmetric information and by a divergence of incentives between the parties. The foremost agency problem, with which proponents of this theory are concerned, is the one

⁴⁴ See e.g. OLIVER HART, FIRMS CONTRACTS AND FINANCIAL STRUCTURE (1995), 15ff.

that governs the relationship between the capital suppliers of the firm and the managers; a problem that derives from the separation of management and finance⁴⁵. As in every agency relationship, the contractual relationship between the financiers of the firm (the principals) and the managers (the agents) is characterized by three essential elements:

- (i) The objectives of the principal and the agent do not concur, in the sense that they have different utility functions; thus, the maximization of each one's utility depends on the undertaking of different actions and the making of different decisions.
- (ii) The principal and the agent have different attitudes toward risk; they may prefer different actions because of their different risk preferences (the problem of "risk sharing")⁴⁶.
- (iii) It is difficult or expensive for the principal to verify what the agent is actually doing and if she behaves appropriately. Due to asymmetry of information individual actions cannot be easily observed⁴⁷.

These elements create a problem that is more broadly known as "moral hazard"⁴⁸. In essence, the greatest part of the so-called "agency costs" are moral hazard costs⁴⁹.

⁴⁵ Shleifer & Vishny, *supra* note 34, 740.

⁴⁶ Robert Wilson, *The Structure of Incentives for Decentralization under Uncertainty*, in LA DÉCISION: AGGRÉGATION ET DYNAMIQUE DES ORDRES DE PREFERENCE (G. GUILBAUD ed., 1969) 287, 287; Hayne Leland, *Optimal Risk Sharing and the Leasing of Natural resources with Application to Oil and Gas Leasing on the OCS*, 92 QUARTERLY JOURNAL OF ECONOMICS 413, 418; Stephen Ross, *The Economic Theory of Agency: The Principal's Problem*, 63 AMERICAN ECONOMIC REVIEW 134, 134.

⁴⁷ Bengt Homstrom, *Moral Hazard and Observability*, 10 BELL JOURNAL OF ECONOMICS 74, 74.

⁴⁸ Milton Harris & Artur Raviv, *Optimal Incentive Contracts with Imperfect Information*, 20 JOURNAL OF ECONOMIC THEORY 231, 231. The term "moral hazard" is interchangeably used in theory with the term "hidden action", which conveys the meaning in a more straightforward way to the layperson; *see e.g.* MAS-COLELL, WHINSTON & GREEN, *supra* note 2, 477.

⁴⁹ Michael Jensen & Clifford Smith, *Stockholder, Manager and Creditor Interests: Applications of Agency Theory*, in RECENT ADVANCES IN CORPORATE FINANCE (E. ALTMAN & M. SUBRAHMANYAM eds., 1985).

Therefore, when agency theory states that a corporate governance institution should be conducive for reducing agency costs, it means that a governance structure should help alleviate the moral hazard problem that governs the relationship between the financiers of the firm and the managers. Institutions of corporate governance should reduce the range of actions, for which the capital suppliers have disutility while the managers have utility, by generating an optimal incentive scheme.

Transaction-cost economics, apart from the problem of *stricto sensu* incompleteness, lay traditionally emphasis on the problem of post-contractual opportunistic behavior⁵⁰. Contracts are not always honored by the parties and in the presence of appropriable quasi-rents the possibility of opportunistic behavior is very real. Transaction-cost economists claim that dealing with the problem of “jockeying” over quasi-rents will be done at less cost if done through vertical integration, namely within a firm, rather than through market contracting. However, given the contractual basis of the firm, transferring quasi-rents from the contractual relationships of the conventional market inside the firm will not completely eliminate the problem of opportunistic behavior. The firm, as a nexus of contracts, will keep on generating quasi-rents and corporate governance institutions will be used to constrain opportunism and shape the ex-post bargaining over these rents⁵¹.

95; Stephen Ross, *The Economic Theory of Agency: The principal's problem*, 63 AMERICAN ECONOMIC REVIEW 134

⁵⁰ Klein et al., *supra* note 33, 297

⁵¹ Zingales, *supra* note 41, 501

If closely examined, the hazard of opportunism that transaction-cost economics focus on is not different in substance to moral hazard, on which agency theory focuses⁵². The only difference seems to be in terms of the perspective of the problem: agency theory examines the problem of the relationship between the financiers of the firm and the managers from an *ex ante* incentive-alignment point of view, while transaction-cost economics are more concerned with establishing *ex post* governance mechanisms⁵³, which will mitigate the adverse effects of the suboptimal structure of the initial contract. In both cases, however, we are discussing the design of mechanisms that will help the members of the firm surpass the inherent problems of the underlying contracts that they have entered into. Agency theory will focus more on the design of “preventive” measures, while transaction-cost economics will lay emphasis more on the design of “repressive” measures.

The bottom line, however, is that both moral hazard costs and the hazard of opportunism are dimensions of the same *lato sensu* incompleteness of contracts, so that this very attribute of contracts can be thought of as driving the establishment and design of a great deal of institutions of corporate governance. Without corporate governance market players would have no way to fend off the cognitive chaos that would derive from

⁵² Williamson, *supra* note 32, 123

⁵³ I use the term “mechanism” in its game theoretic sense; a set of rules that one player (the principal) establishes and another (the agent) freely accepts in order to convey information from the second player to the first. The mechanism is essentially an information report by the agent to the principal. In this framework, the design of corporate governance mechanisms is a sub-category of the general mechanism design, on which game theory discourses focus; see ERIC RASMUSEN, GAMES AND INFORMATION: AN INTRODUCTION TO GAME THEORY (2001) 240ff.

the uncertainties that are associated with the incompleteness of contracts⁵⁴. As it will become evident in the third part of this paper, many of the provisions found in venture capital financing contracts essentially attempt to establish a corporate governance mechanism that will address the problem of moral hazard, which the contractual relationship between the start-up firm and the venture capitalist (henceforth: VC) would otherwise generate.

2. Adverse Selection

The main cause of moral hazard is asymmetric information *during* the period, in which a contract governs a relationship. However, apart from moral hazard, economists refer to a second type of agency problem known as adverse selection, which stems from asymmetric information *prior* to entering into a contract⁵⁵. Adverse selection is a problem particularly associated with VC financing.

While moral hazard derives from the agent's hidden action, adverse selection stems from the agent's hidden information. The agent knows more about her ability than the principal does at the time of contracting, just like the seller of a product may know more about the quality of the item she sells than the buyer. The principal has thus imperfect information about the agent's innate work disutility and therefore within the framework of a firm it might be difficult to hire only managers with high ability⁵⁶. In the absence of mechanisms that can help distinguish high-ability managers from low-ability

⁵⁴ For the role of innovative legal devices, like private governance mechanisms, in managing uncertainty *see in general* John Flood, *Doing Business: The Management of Uncertainty in Lawyers Work*, 25 LAW AND SOCIETY REVIEW 41

⁵⁵ MAS-COLELL, WHINSTON & GREEN, *supra* note 2, 436ff.

⁵⁶ Ian Ayres & Peter Cramton, *Relational Investing and Agency Theory*, 15 CARDOZO LAW REVIEW 1033, 1040

managers it will be in the interest of the latter to withhold information about their skills⁵⁷. Corporate governance institutions can help to structure schemes that will incentivize potential managers to signal their ability to the principals prior to entering the contract, so that the pooling problem can be tackled⁵⁸.

In start-up firms that seek financing, a variation of the adverse selection problem appears, where the entrepreneur has better information about the profitability and the prospects of the existing firm, than VCs do⁵⁹. In subsequent parts of this paper (II and III.B.5) I will examine how VCs screen entrepreneurs and deal with this idiosyncratic agency problem. The take-away for the moment from this brief presentation of the adverse selection problem is that it is another challenge of contracting, another dimension of the *lato sensu* incompleteness of contracts and hence also drives the design of corporate governance mechanisms.

3. Stricto Sensu Incompleteness of Contracts

As it was noted earlier in this chapter, transaction-cost economics have as their starting point the *stricto sensu* incompleteness of contracts: parties to a contract cannot possibly lay out all future contingencies and hence the contract will remain incomplete (see I.B). This dimension of the inherent problems of contracts has not been adequately emphasized by the prevalent approach to the theory of the firm, which constrains its discourse to incentive (agency) problems. Nonetheless, the mere fact that future

⁵⁷ Sanford Grossman, *The Informational Role of Warranties and Private Disclosure about Product Quality*, 24 JOURNAL OF LAW AND ECONOMICS 461, 461

⁵⁸ For the view of corporate governance as a tool for dealing with adverse selection see e.g. Tirole, *supra* note 42, 2

⁵⁹ See Stewart Myers & Nicholas Majluf, *Corporate Financing and Investment Decisions when Firms Have Information that Investors Do Not Have*, 13 JOURNAL OF FINANCIAL ECONOMICS 187

eventualities cannot be foreseen within the scope of the initial contract between the financiers of the firm and the managers is in reality one of the most significant determinants of corporate governance design. Over the past twenty years the so-called “financial contracting literature”⁶⁰ has tried to integrate this factor in the discourse of the theory of the firm by focusing on how decision-control rights should be allocated among the members of a firm.

Agency theory has gone to great lengths to establish a comprehensive theory about the firm based on the problem of asymmetric information. Although the conflict of interests between the capital suppliers of the firm and the managers has significant influence in the way corporate contractual packages are designed, it does not provide us with the complete picture about the limitations that these two parties face when contracting. The problem is that by focusing exclusively on this viewpoint of the conflict between the investors and the manager we take as granted that the relationship between the two is static, in the sense that, no matter what the circumstances are, the manager will act in a specific way that is contrary to the utility of the investors. However, the relationship between the manager and the financiers of the firm is actually dynamic⁶¹; the nature and type of the conflict of interest between the two parties is subject to alterations

⁶⁰ See e.g. Philippe Aghion & Patrick Bolton, *An Incomplete Contracts Approach to Financial Contracting*, 59 REVIEW OF ECONOMIC STUDIES 473; Patrick Bolton & David Scharfstein, *A Theory of Predation Based on Agency Problems in Financial Contracting*, 80 AMERICAN ECONOMIC REVIEW 94; Oliver Hart & John Moore, *Property Rights and the Nature of the Firm*, 98 JOURNAL OF POLITICAL ECONOMY 1119 [hereinafter Hart & Moore, *Property Rights*]; Oliver Hart & John Moore, *Default and Renegotiation: A Dynamic Model of Debt* 113 QUARTERLY JOURNAL OF ECONOMICS 1 [hereinafter: Hart & Moore, *Default and Renegotiation*]; Oliver Hart, *Incomplete Contracts and the Theory of the Firm*, 4 JOURNAL OF LAW ECONOMICS AND ORGANIZATION 119 [hereinafter: Hart, *Incomplete Contracts*]; Oliver Hart, *Financial Contracting*, 39 JOURNAL OF ECONOMIC LITERATURE 1079 [hereinafter: Hart, *Financial Contracting*]; HART, *supra* note 14, 95ff.

⁶¹ Hart, *Financial Contracting*, 1083

depending on the ever-changing states of the world and on unexpected eventualities. Therefore, provisions in the initial contract that, based on the remarks of agency theory, attempt to align the incentives of the two parties (: corporate governance mechanisms) cannot be expected to work in all possible future contingencies. Important new decisions, whose timing and nature is unknown during the draft of the initial contract, must be taken in response to these eventualities, since the incentive-alignment scheme put forward under the original contractual package might not be the optimal under the new circumstances. Incentive schemes, although they aspire to be comprehensive, cannot possibly be “one-size-fits-all”. Therefore, as Hart puts it “...although the contracting parties cannot specify what decisions should be made as a function of (impossible) hard-to-anticipate-and-describe future contingencies, they can choose a decision-making *process* in advance”⁶². In other words, non-conceivable eventualities create the need to design institutions that will allocate decision-making power over future strategic decisions among the members of the firm. Consequently, *stricto sensu* incompleteness of contracts adds another issue in the design of the corporate contract, another challenge for the design of corporate governance institutions: how should residual rights of control – “defined as rights to decide between different transactions in contingencies left out of the initial contract”⁶³- be allocated among the members of the firm⁶⁴? Which mechanisms should be used to ensure that the key corporate decisions under future states of the world

⁶² Hart, *Financial Contracting*, 1084

⁶³ Patrick Bolton & Antoine Faure-Grimaud, *Satisficing Contracts*, NBER Working Paper No. 14654 available at <http://www.nber.org/papers/w14654>

⁶⁴ Hart, *Incomplete Contracts*, 124

will be made by the party to the contract that has the optimal incentives given the circumstances?

As it will be shown later in this paper (III.C) the issue of allocation of control rights among the members of the firm is of extreme importance in the highly uncertain and ever-changing environment of VC financings. In an uncertain economic environment, where the ability to adjust is a valuable asset by itself, the specification of the authority over key corporate decisions is a vital issue. For the moment though, the take-away is that the way decision power is allocated within a firm is of great significance for the design of this firm's governance structure.

II. Screening Private Information: How VCs Deal With Adverse Selection

A. The Theory of Financial Intermediation and Venture Capital

As it became evident in the previous chapter, informational asymmetries have a dominant position in the discourse about the design of financial contracts and governance institutions. This comes as no surprise to those who are familiar with the theory of strategic interactions, since most real world situations are indeed games of incomplete rather than complete information. However, in the financial market informational asymmetries are much more intensely pronounced than in other situations where rational players with private information interact⁶⁵. As far as public financial markets are concerned, securities regulation determines how parties share information with each other and thus -to a certain extent- regulation mitigates the problems caused by these

⁶⁵ Hayne Leland & David Pyle, *Informational Asymmetries, Financial Structure and Financial Intermediation*, 32 JOURNAL OF FINANCE 371, 371

asymmetries. But, in the world of private financing companies are not obliged by legal rules to publish any information to potential financiers. Apparently, entrepreneurs seeking financing will be *de facto* required to disclose information, but still the absence of a mandatory disclosure regime preserves a high level of costly market imperfections and creates an environment of uncertainty. The result is a market structure that is far from being ideal according to the Arrow-Debreu model, where full information prevails⁶⁶. The more a market departs from this theoretical benchmark, the more prone to failure it becomes⁶⁷. Without a device that would produce and transfer information from the entrepreneurs to investors, the venture capital markets may fail to exist⁶⁸.

Where many entrepreneurs seek financing at the same time, the investors cannot discriminate between good and bad projects. The entrepreneurs know their industriousness, moral rectitude and the quality of their projects, but the investors do not possess that information. In a pool of projects that seek financing there will be necessarily high quality and low quality projects. The entrepreneurs have the incentive to overstate the favorable aspect of the project, while downplaying the negatives, thus essentially leading to a situation where all entrepreneurs claim that their project is of high quality⁶⁹. Since the investors cannot discern the high quality projects from the low quality

⁶⁶ Kenneth Arrow & Gerard Debreu, *Existence of Equilibrium for a Competitive Economy*, 22 *ECONOMETRICA* 265ff.; In sum, Arrow and Debreu show that when preferences and production sets satisfy basic convexity and continuity conditions and there is full information, agents are atomistic and there are no externalities, then there will be prices, which clear markets and make individual plans consistent.

⁶⁷ For an overview of the financing constraints created in debt and equity markets due to informational asymmetries see Glenn Hubbard, *Capital Market Imperfections and Investment*, 36 *JOURNAL OF ECONOMIC LITERATURE* 193

⁶⁸ Leland & Pyle, *supra* note 65, 371; Yuk-Shee Chan, *On the Positive Role of Financial Intermediation in Allocation of Venture Capital in a Market with Imperfect Information*, 38 *JOURNAL OF FINANCE* 1543, 1544

⁶⁹ Brigitte Haar, *Venture Capital Funding for Biotech Pharmaceutical Companies*, in *SPONTANEOUS ORDER, ORGANIZATION AND THE LAW* (T. EINHORN ed., 2001), 162

projects, the best they can do is to offer to invest at a price that reflects the average quality of the pool⁷⁰; interest rates (if the investment is made through debt instruments) or the portion of the profits asked in exchange (if the investment is made through equity instruments) will be adjusted to the average quality of the pool⁷¹. Demanding yields for a project of only average quality will result in high cost of capital for entrepreneurs, who have high quality projects⁷²; high quality projects essentially take the biggest discount, when the investors discount the stream of benefits for the probability that they will not materialize⁷³. As a result high quality entrepreneurs will withdraw from the pool and gradually only bad quality projects (“lemons”)⁷⁴ will be left for financing⁷⁵.

The pool price effectively subsidizes low quality and penalizes high quality projects. This problem exists in every investment environment, but seems to be particularly acute in entrepreneurial finance. Start-up firms are young and volatile with no track record that would provide information about their potential⁷⁶ and often with no assets at all that could serve as collateral. These attributes make the effects of informational market failures more severe in entrepreneurial finance than in the financing of established firms. Therefore, this market is in dire need of an agent that will produce

⁷⁰ PETER SPENCER, *THE STRUCTURE AND REGULATION OF FINANCIAL MARKETS* (2000), 11

⁷¹ Michael Whincop, *The Gap into Governance*, in *BRIDGING THE ENTREPRENEURIAL FINANCING GAP: LINKING GOVERNANCE WITH REGULATORY POLICY* (M. WHINCOP, ed., 2001), 1

⁷² Leland & Pyle, *supra* note 65, 371

⁷³ Whincop, *supra* note 71, 3

⁷⁴ George Akerlof, *The Market for Lemons: Qualitative Uncertainty and the Market Mechanism*, 84 *QUARTERLY JOURNAL OF ECONOMICS*, 488;

⁷⁵ Raphael Amit et al., *Entrepreneurial Ability, Venture Investments and Risk Sharing*, 36 *MANAGEMENT SCIENCE* 1232, 1232-1234

⁷⁶ George Triantis, *Financial Contract Design in the World of Venture Capital*, 68 *UNIVERSITY OF CHICAGO LAW REVIEW* 308, 312; Sushen Wang & Hailan Zhou, *Staged Financing in Venture Capital: Moral Hazard and Risks*, 10 *JOURNAL OF CORPORATE FINANCE* 131, 131

information about the qualities of the projects⁷⁷ and will transfer it, so as to bridge some of the informational asymmetry that exists between entrepreneurs and investors.

Information production is deemed to be a sufficient condition for the emergence of financial intermediaries⁷⁸ that will be delegated the costly tasks of screening and monitoring investments⁷⁹. Financial intermediaries attenuate the informational obstacles by taking advantage of economies of specialization and scale⁸⁰. The company research and the monitoring that intermediaries undertake is centralized and thus the costs associated with decentralization that would exist, if individual investors had to perform these tasks, are significantly reduced. Therefore, for these activities intermediaries are said to have a comparative net cost advantage⁸¹.

In the entrepreneurial finance world venture capital funds perform this intermediary function and thus improve allocational efficiency⁸². Through the use of debt, equity or hybrid securities they make capital and professional services available to firms that might otherwise be excluded from other sources of private finance⁸³. Universally, there are four main types of venture capital funds: small business investment companies (SBICs), financial VC funds, corporate VC funds and VC limited

⁷⁷ Chan, *supra* note 68, 1543

⁷⁸ Tim Campbell & William Kracaw, *Information Production, Market Signaling, and the Theory of Financial Intermediation*, 35 JOURNAL OF FINANCE 863, 863

⁷⁹ Douglas Diamond, *Financial Intermediation and Delegated Monitoring*, 51 REVIEW OF ECONOMIC STUDIES 393, 393

⁸⁰ Haar, *supra* note 57, 163

⁸¹ XAVIER FREIXAS & JEAN-CHARLES ROCHET, MICROECONOMICS OF BANKING (1997), 29

⁸² One of the reasons why banks have not undertaken the role of the intermediary in the financing of start-up firms will become evident in 2.B.v.

⁸³ A concise definition of venture capital is the one provided by the British Venture Capital Association “venture capital refers to financing the start-up development, expansion or purchase of a firm, in the act of which the venture capital investor acquires, by agreement, a proportion of the share capital in the business in return for providing funding”; see GAVIN REID, VENTURE CAPITAL INVESTMENT: AN AGENCY ANALYSIS OF PRACTICE (1998), 15

partnerships⁸⁴. In the US the prevalent type of organization for funds is the limited partnership⁸⁵. Under the partnership agreement a VC firm, more often referred to as the “venture capitalist”, acts as the general partner, while individual and institutional investors invest in the partnership as limited partners. Investment and monitoring decisions are delegated to the VC, who has significant discretion over the funds of the partnership⁸⁶. Usually the partnership agreement does not allow the fund to reinvest profits or issue debt⁸⁷; this effectively leads to the so-called “venture capital cycle”⁸⁸, which means that capital is first raised, then invested and in the end returned to the investors. This cycle differentiates VC funds as financial intermediaries from other information production devices such as banks, which raise, invest and return capital all at the same time⁸⁹. The structure and organization of VC funds features many of the traditional incentive and incomplete contracting problems that were touched upon in the previous chapter. Their analysis though is beyond the scope of the current paper, which is primarily concerned with the contract between the VC and the start-up firm and not with the (distinct) contract between the investors of the VC fund and the venture capitalist⁹⁰. Nonetheless, whenever the content of the contract between the investors of the VC fund

⁸⁴ Joseph McCahery & Luc Renneboog, *Venture Capital Financing of Innovative Firms: An Introduction*, in VENTURE CAPITAL CONTRACTING AND THE VALUATION OF HIGH-TECHNOLOGY FIRMS (J. MCCAHERY & L. RENNEBOOG eds., 2003), 5

⁸⁵ M. Klausner & K. Litvak, *What Economists Have Taught Us About Venture Capital Contracting*, in BRIDGING THE ENTREPRENEURIAL FINANCING GAP, *supra* note 71, 69

⁸⁶ McCahery & Renneboog, *supra* note 84, 5

⁸⁷ PAUL GOMPERS & JOSH LERNER, *THE VENTURE CAPITAL CYCLE* (1999), 38

⁸⁸ The term is coined by Gompers and Lerner through the title of their book; *see supra* note 72

⁸⁹ Georg Gebhardt, *A Soft Budget Constraint Explanation for the Venture Capital Cycle*, 10 GERMAN ECONOMIC REVIEW 71, 72

⁹⁰ For an overview of the rights and obligations of each group that are spelled out in the partnership agreement that establishes the VC fund *see* William Sahlman, *The Structure and Governance of Venture-Capital Organizations*, 27 JOURNAL OF FINANCIAL ECONOMICS 473, 489ff.

and the VC firm affects the contract between the latter and the start-up firm there will be special reference in the text.

B. The Staged Investment of Venture Capital

1. Integrating Governance Design into the Screening Game

A flashback to Part I would remind us that corporate governance institutions are put in place to deal with the dimensions of the incompleteness of the contract between the members of a firm. Corporate governance mechanisms provide a governing framework for pursuing strategic objectives and economic tasks that might otherwise prove unfeasible. Without these institutions it would be impossible for the suppliers of finance to corporations to assure themselves of getting a return on their investment⁹¹. Whether these institutions will attain their goal or not, depends not only on giving the right incentives to the manager (for our purposes to the entrepreneur), but also on choosing the right entrepreneur since the very beginning⁹². Therefore, the browse for the most effective process of *screening* entrepreneurs, with whom the VC is going to enter into a contractual relationship, is essentially a reflection on the design of another governance institution. The need for screening derives from the need to deal with the problem of adverse selection, yet another dimension of the incompleteness of contracts. Since

⁹¹ Shleifer & Vishny, *supra* note 34, 737 define corporate governance as the ways, in which financiers make sure that they will get a return on their investment. This could be considered as a teleological definition for corporate governance, namely a definition that focuses on the *ultimate* purpose of this institutional edifice. It does not, however, tell us how these institutions work and what makes them necessary, in order to achieve this result.; *see also* George Triantis, *Debt Financing, Corporate Decision Making and Security Design*, 26 CANADIAN BUSINESS LAW JOURNAL 93, 93: “the goal of corporate governance is to ensure that managers act as perfect agents of their principals, the firm’s shareholders”.

⁹² Mark Roe, *The Institutions of Corporate Governance*, in THE HANDBOOK OF NEW INSTITUTIONAL ECONOMICS (C. MENARD & M. SHIRLEY eds., 2008), 373

incompleteness is the driving force behind all institutions of corporate governance in private companies, it follows that the screening mechanism is itself such an institution.

The challenge for the VC in the design of this mechanism is to obtain the unraveling of information; the mechanism should be calculated to result in the disclosure of the entrepreneurs' private information about the quality of their project⁹³. The VC should always have in mind that the courtship with the entrepreneur is essentially a screening game, as game theory puts it; the informed player, the entrepreneur, moves second and always in response to contracts offered by the uninformed player, the VC⁹⁴.

In economics literature it has been repeatedly postulated that a mandatory legal rule that would compel a disclosure on behalf of the informed party is all that is needed to ensure that the unraveling result will occur⁹⁵. Nonetheless, in our case the entrepreneurs possess private *nonverifiable* information, which means that, even if the information is revealed, neither the VC nor any third party, such as a court, has a direct way of checking the truthfulness of the disclosure⁹⁶. In these situations information is best conveyed by self-selection⁹⁷, namely on the basis of inferences drawn by observing the actions of the entrepreneur. Where a simple message would not work, a signal does work; actions speak louder than words⁹⁸. Therefore, what the VC should do is find a way to induce the

⁹³ For the unraveling result see e.g. Masahiro Okuno-Fujiwara et al., *Strategic Information Revelation*, 57 REVIEW OF ECONOMIC STUDIES 25

⁹⁴ For screening games in general see RASMUSEN, *supra* note 53, 277ff.

⁹⁵ Paul Milgrom, *Good News and Bad News: Representation Theorems and Applications*, 12 BELL JOURNAL OF ECONOMICS 380, 387; Sanford Grossman, *The Informational Role of Warranties and Private Disclosure About Product Quality*, 24 JOURNAL OF LAW AND ECONOMICS 461

⁹⁶ DOUGLAS BAIRD, ROBERT GERTNER & RANDAL PICKER, *GAME THEORY AND THE LAW* (1994), 122

⁹⁷ Joseph Stiglitz, *Information and Economic Analysis: A Perspective*, 95 THE ECONOMIC JOURNAL 21, 24

⁹⁸ ERIC RASMUSEN, *GAMES AND INFORMATION: AN INTRODUCTION TO GAME THEORY* (2007), 327

entrepreneurs to signal their ability and the quality of their projects; to convey the private information by means of their actions.

The mechanism that is usually used by VCs, in order to induce the signaling on behalf of the entrepreneurs is staggered financing or else staged investment. The amount of the initial investment is usually small (seed capital) and additional investments (development, start-up and expansion financing prior to going public⁹⁹) are contingent on observable measures of financial and non-financial performance¹⁰⁰. Staggered financing allows the VC to reserve an exit option and provide its investment with a “wait-and-see” flexibility¹⁰¹. The higher the risk of the start-up firm, the higher the value of this option for the VC¹⁰². The investment decision is delayed for future points, where the level of certainty about the future prospects of the firm increases. The VC periodically reevaluates the prospects of the firm and reserves the right to either further invest in the project, if it thinks that it is in its interest or discontinue the financing¹⁰³. Venture capital staged investment is a good example of a partial equilibrium model that is embedded in a

⁹⁹ Seed capital is the initial investment of a small sum in the entrepreneur who has an attractive idea; the development stage includes financing for the construction of a prototype; in the start-up stage of financing the firm is provided the resources for commercial production and marketing promotion of its product; expansion financing is often the last stage of investment before underwriters are involved and the firm is taken public, although bridge financing, which fills the gap between expansion financing and the IPO might be required some times; see Swee-Sum Lam, *Venture Capital Financing: A Conceptual Framework*, 18 JOURNAL OF BUSINESS, FINANCE & ACCOUNTING 137, 138-139

¹⁰⁰ Klausner & Litvak, *supra* note 70, 60; Steven Kaplan & Per Strömberg, *Financial Contracting Theory Meets the Real World: An Empirical Analysis of Venture Capital Contracts*, 69 REVIEW OF ECONOMIC STUDIES 1, 2

¹⁰¹ Han Smit & Lenos Trigeorgis, *Real Options: Principles of Valuation and Strategy*, in VENTURE CAPITAL CONTRACTING, *supra* note 69, 228

¹⁰² Wang & Zhou, *supra* note 76, 132

¹⁰³ Paul Gompers, *Optimal Investment, Monitoring and the Staging of Venture Capital*, 50 JOURNAL OF FINANCE 1461, 1462

Bayesian universe, where parties have an initial “malleable” belief on the information they do not possess and they revise it as the interaction with the entrepreneur unfolds¹⁰⁴.

Before examining the screening function of staged investment, we should first touch upon another reason that purports to affect the decision of the vast majority of VC firms to stage the infusion of their capital in the entrepreneurial firms¹⁰⁵.

2. Real Options Theory and Staged Investment

Investing in a start-up firm is highly uncertain. Usually the value of such firms is locked in growth options¹⁰⁶ and with the standard Discounted Cash Flow (DCF) analysis they might appear to have a negative present value (NPV). A negative NPV, though, suggests that the VC should not make the investment in the project at all. If this is the case, why would a rational VC ever provide financing to a start-up firm? Does investment-decision making in the VC industry indeed rely on traditional DCF valuations?

The traditional DCF has lost its popularity as a project selection criterion¹⁰⁷. VCs have turned to options thinking, so as to capture the value of managerial flexibility in their valuation of a start-up firm. DCF is a static method of financial valuation and is unable to accommodate the flexibility that the start-up firm will obtain, when the VC will

¹⁰⁴ SALANIE, *supra* note 9, 3

¹⁰⁵ Kaplan & Strömberg, *supra* note 100, 12, find that almost 73% of the venture capital financings explicitly include some type of contingency.

¹⁰⁶ Carl Kester, *Today's options for tomorrow's growth*, 62(2) HARVARD BUSINESS REVIEW 153, 153; Triantis, *supra* note 68, 313

¹⁰⁷ Takato Hiraki, *Corporate Governance, Long-Term Investment Orientation, and Real Options in Japan*, in REAL OPTIONS IN CAPITAL INVESTMENT: MODELS, STRATEGIES AND APPLICATIONS (L. TRIGEORGIS ed., 1995), 151

infuse it with active management¹⁰⁸. Options thinking creates a fertile ground for a more dynamic approach to the financial valuation of start-up firms that will emphasize the total strategic value of an entrepreneurial project and will not let short-term negative cash flows deter the investment. By quantifying the value of managerial flexibility in a world of uncertainty this new method of financial valuation allows the VC to view its engagement with the entrepreneur not as a one-time investment, but as a relationship that might give rise to upside opportunities. These opportunities should be treated as corporate real options¹⁰⁹, namely as rights to proceed with (the option of expanding the investment), terminate (the option to discontinue the investment in midstream), or revise the future investment plans. As more information are revealed due to the progress of the project, the VC can decide whether it will exercise the right to continue or terminate the investment. An investment move that creates such rights should be given a higher value than the traditional net present value approach would suggest¹¹⁰. Even investments with negative NPV might end up being beneficial to undertake, if the option values are valued properly.

Real options theory with its financial valuation method allows for strategic adaptability and is thus superior to traditional DCF analysis in settings of extreme uncertainty. This makes it conducive to innovative industries, in which the vast majority of VC firms choose to invest. Real options theory emphasizes the contingent feature of the VC investment and thus, if followed, it induces the VC at the time of the pre-money

¹⁰⁸ Yao-Wen Hsu, *Staging of Venture Capital Investment: A Real Options Analysis*, EFMA 2002 London Meetings, 1 available at <http://ssrn.com/abstract=312012>

¹⁰⁹ Smit & Trigeorgis, *supra* note 101, 228

¹¹⁰ Avinash Dixit & Robert Pyndick, *The Options Approach to Capital Investment*, 73(3) HARVARD BUSINESS REVIEW 105, 105

valuation¹¹¹ and of the investment decision to stagger the financing to the entrepreneurial firm. In other words, real options theory as a concept and as a method of financial valuation presupposes the staging of the investment. Without staged investment there would be no options to value and the only financial valuation method would be DCF, which would show most start-up firms as having a negative NPV, thus discouraging any kind of VC investment.

3. Staged Investment as a Screening Strategy

i. The traditional view of staged financing as a monitoring device

Staging the commitment of capital in a start-up firm can indeed be a very efficient control mechanism. When the VC sets performance milestones that the entrepreneur has to obtain, in order for the financing to proceed to the next stage, a strong incentive device is in place that can help confront the “shirking” problem in the agency relationship between the VC firm and the entrepreneur¹¹². This is why staged capital infusion is believed¹¹³ to be serving a disciplining function equivalent to that of debt in the public firm setting¹¹⁴. In addition to this, experimental game theory has showed that in a labor relation repeated interaction with the same player increases effort levels as compared to

¹¹¹ Pre-money valuation is defined as “the product of the number of shares of common stock outstanding prior to the venture round multiplied by the price per share set in the new financing round”; see Josh Lerner, *The Importance of Patent Scope: An Empirical Analysis*, 25 RAND JOURNAL OF ECONOMICS 319, 326

¹¹² Nonetheless, at the same time staged financing has been accused as inducing the entrepreneur to focus on short-term performance; see Thomas Hellmann, *Financial Structure and Control in Venture Capital*, Chapter 2 from PhD dissertation, available at <http://strategy.sauder.ubc.ca/hellmann/pdfs/>

¹¹³ GOMPERS & LERNER, *supra* note 87, 139

¹¹⁴ For the role of debt as a monitoring and incentive device in public firms see Michael Jensen, *Active Investors, LBOs and the Privatization of Bankruptcy*, 2 JOURNAL OF APPLIED CORPORATE FINANCE 35

one-shot interactions¹¹⁵. Sequential financing rounds allow for this repeated interaction to emerge and thus give space for this kind of result to be realized.

Although, traditionally, venture capital literature views staged investment as a monitoring device conducive to deal with the problem of moral hazard costs¹¹⁶, I argue here that it should *also* be viewed as a screening strategy that withstands the adverse selection problem.

The default argument of those who concur with this view is that making finance contingent on a performance milestone will deter an entrepreneur with a low-quality project to approach the VC¹¹⁷. Inserting this contingency in the financing contract shifts the risk of failure from the VC to the entrepreneur and it would thus be “foolish for entrepreneurs to accept such contract terms, if they were not truly confident of their own abilities and deeply committed in the venture”¹¹⁸. It is well substantiated in corporate theory that a party’s agreement to assume a risk signals this party’s private information about the probability and the severity of the risk¹¹⁹.

ii. A behavioral approach to staged investment: Looking for entrepreneurial intrinsic motivation

While the aforementioned arguments are plausible, I argue that by using a behavioral approach to the entrepreneur’s decision-making process in applying for financing, one can understand better why staged investment serves as a screening tool.

¹¹⁵ Armin Falk, Simon Gächter & Judit Kovacs, *Intrinsic Motivation and Extrinsic Incentives in a Repeated Game with Incomplete Contracts*, 20 JOURNAL OF ECONOMIC PSYCHOLOGY 251

¹¹⁶ Wang & Zhou, *supra* note 76, 132

¹¹⁷ Klausner & Litvak, *supra* note 85, 60

¹¹⁸ Sahlman, *supra* note 90, 510

¹¹⁹ Albert Choi & George Triantis, *Strategic Vagueness: The Case of Material Adverse Change (MAC) Clauses*, YALE LAW JOURNAL (forthcoming) (on file with author)

Neoclassical economic models assume that people dislike working and thus have a tendency to shirk¹²⁰; therefore the only way to induce them to expend effort is by providing them with extrinsic incentives, such as monetary rewards¹²¹. However, empirical surveys show that pecuniary compensation is not of the greatest importance to workers and that people undertake certain activities because of intrinsic motivation and without expecting an extrinsic reward¹²². Intrinsic motivation pushes employees to expend more effort in their work than required¹²³. In the human resources literature it has been claimed that excessive compensations and incentive payment schemes can seriously undermine a worker's intrinsic motivation¹²⁴, which seems to be the foremost element that empowers production.

In the venture capital world there are two categories of entrepreneurs: those who are motivated and will pursue their project because they see intrinsic benefits in it and those who do not derive intrinsic utility from working on the project, but would be willing to pursue it, if they had sufficient extrinsic rewards. According to the aforementioned empirical studies the former category of entrepreneurs is more likely to expend greater effort when working on the project, while entrepreneurs in the latter category are undertaking the project more because of the pecuniary reward and less for the job satisfaction. Obviously, it is in the interest of the VC to sign a financing contract

¹²⁰ Bruno Fey, *Shirking or Work Morale? The Impact of Regulating*, 37 EUROPEAN ECONOMIC REVIEW 1523, 1523;

¹²¹ Gary Becker & George Stigler, *Law enforcement, malfeasance, and the compensation of enforcers*, 3 JOURNAL OF LEGAL STUDIES, 1; Edward Lazear, *Performance Pay and Productivity*, 90 AMERICAN ECONOMIC REVIEW 1346

¹²² James Baron, *The Employment Relation as a Social Relation*, 2 JOURNAL OF THE JAPANESE AND INTERNATIONAL ECONOMIES, 492;

¹²³ Edward Deci, *Effects of Externally Mediated Rewards on Intrinsic motivation*, 18 JOURNAL OF PERSONALITY AND SOCIAL PSYCHOLOGY 105, 108

¹²⁴ JAMES BARON & DAVID KREPS, STRATEGIC HUMAN RESOURCES (1999), 99

with the intrinsically motivated entrepreneurs rather than with those who will only respond to the money offer. The structure of a staged “back-end loaded” investment is conducive to discourage the low motivated entrepreneurs from approaching the VC, since at first sight such an investment does not appear to include a sufficient extrinsic reward¹²⁵. Thus, staggered financing that starts with a small capital infusion in the first round, but gradually increases as the venture meets performance milestones, can serve as a screening device inducing low motivated entrepreneurs to withdraw from the pool. Intrinsically motivated entrepreneurs with a capability of greater production signal their motivation by staying in the pool and thus VCs can successfully overcome the adverse selection problem simply via the terms of the financial contract they offer.

iii. The problem of “soft-budget constraints”

Although the aforementioned screening strategy might seem to work perfectly well in terms of dealing with the adverse selection problem, a certain fraction of the economic literature would suggest that it fails to do so due to the so-called “soft-budget constraint” syndrome. The term was coined by Janos Kornai within the scope of the study of the economic behavior in socialist economies¹²⁶, where loss-making enterprises¹²⁷ were being consistently refinanced despite the obvious inefficiency associated with this

¹²⁵ In an analogous setting Delfgaauw & Dur argued that it may be in the interest of the firm to offer a low wage so as to discourage relatively low motivated workers from applying for a vacancy; Josse Delfgaauw & Robert Dur, *Signaling and Screening of Workers’ Motivation*, 62 JOURNAL OF ECONOMIC BEHAVIOR AND ORGANIZATION 604

¹²⁶ Janos Kornai, *The Soft Budget Constraint*, 39 KYKLOS 3

¹²⁷ Mathias Dewatripont & Gerard Roland, *Soft Budget Constraints, Transition, and Financial Systems*, 156 JOURNAL OF INSTITUTIONAL AND THEORETICAL ECONOMICS 245, 245

practice¹²⁸. Despite its intellectual origins the concept of soft-budget constraints has become pertinent in microeconomic theory as well¹²⁹. It refers to the dynamic incentive problem of a funding source that cannot credibly commit at the time of the initial investment not to refinance a failing company¹³⁰.

Here is how the soft-budget constraint syndrome works: A funding source (e.g. the government or a bank) agrees to finance an organization (e.g. a utilities enterprise or a firm) that needs capital to sustain its operations. In order to induce the managers of the funded organization to expend optimal effort, the funding source commits not to provide further financing after the initial investment, if the organization fails to produce the cash flows that will assure a return on the source's investment. However, when the funded firm ultimately fails to provide a return on the investment, the funding source is tempted to refinance the firm despite the failure¹³¹. As a rational agent the source knows that the initial investment, which produced a zero payoff¹³², is now a sunk cost¹³³, namely a cost that cannot be recovered once incurred. If operations of the funded firm were discontinued, then this investment would certainly be lost forever¹³⁴; the only chance to recoup and salvage¹³⁵ this past investment is to refinance the failed firm, because then the payoff might be positive. In other words, the only way the funding source can be better

¹²⁸ GUN ERIKSSON SKOOG, THE SOFT BUDGET CONSTRAINT: THE EMERGENCE, PERSISTENCE AND LOGIC OF AN INSTITUTION (2000), 2; Janos Kornai et al., *Understanding the Soft Budget Constraint*, 41 JOURNAL OF ECONOMIC LITERATURE 1095, 1096

¹²⁹ *Id.* at 1095

¹³⁰ Dewatripont & Roland, *supra* note 127, 246; Kornai et al., *supra* note 128, 1099

¹³¹ Dewatripont & Roland, *supra* note 127, 246

¹³² Kornai et al., *supra* note 128, 1108

¹³³ Dewatripont & Roland, *supra* note 127, 246

¹³⁴ Kornai et al., *supra* note 128, 1099

¹³⁵ GOMPERS & LERNER, *supra* note 87, 38

off given the situation is by refinancing the firm¹³⁶. It is often better to attempt a turn-around by means of a follow-on financing than simply to cut losses by terminating the investment¹³⁷. There is, thus, *ex post* an irresistible force that pushes the financier to essentially bailout the financed firm. The funding source is averse to liquidation and would prefer to renegotiate the terms of financing¹³⁸.

Therefore, from an *ex ante* point of view it is in the interest of the funding source to commit not to continue the financing, if the firm proves to be a bad investment. From an *ex post* perspective, however, the only rational decision for the funding source is to refinance the failed firm¹³⁹. This divergence of the *ex ante* and *ex post* perspectives results in the funding source's inability to *credibly* commit at the time of the initial investment to discontinue the financing in case the firm fails. The threat of termination would deter managers of firms with poor prospects to approach the funding source for financing, but given that no such threat can credibly be declared, firms with low-quality projects will not withdraw from the pool of applicants for financing¹⁴⁰.

The soft-budget constraint variable can completely alter the outcomes of the venture capital screening game that we modeled under II.B.3.iii. Entrepreneurs with poor motivation and low-quality projects would still approach the VC, since they know that a

¹³⁶ Mathias Dewatripont & Eric Maskin, *Credit and Efficiency in Centralized and Decentralized Economies*, 62 REVIEW OF ECONOMIC STUDIES 541, 541

¹³⁷ See Philipp Krohmer, *The Liquidation Dilemma of Money Losing Investments - The Impact of Investment Experience and Window Dressing of Private Equity and Venture Capital Funds*, December 2007, available at SSRN: <http://ssrn.com/abstract=1071671>

¹³⁸ See Hart & Moore, *Default and Renegotiation* and Oliver Hart & John Moore, *A Theory of Debt Based Upon the Inalienability of Human Capital*, 109 QUARTERLY JOURNAL OF ECONOMICS 841; the two authors note that when the liquidation damages not only the firm but also the interests of the investors, then the latter might prefer to renegotiate the financial contract than to suffer the losses of liquidation.

¹³⁹ Klausner & Litvak, *supra* note 85, 61

¹⁴⁰ Dewatripont & Maskin, *supra* note 127, 541; Kornai et al., *supra* note 128, 1110

rational VC would not ultimately follow the initially planned structure of staged investment and terminate the financing due to low performance. That means that entrepreneurs would no longer be subject to the negative payoff that liquidation would earn them after the termination of financing¹⁴¹. Consequently, they do not have an incentive to withdraw from the pool and thus they nurture the adverse selection problem.

Therefore the question arises: is there a governance mechanism, whose design can invalidate the soft-budget constraint problem and preserve the efficient screening function of staggered financing? What corporate governance institution can put a hard budget constraint in place that will make poor quality entrepreneurs withdraw from the pool?

iv. The VC partnership agreement as a hard budget constraint

The corporate governance institution that introduces a hard budget constraint to the VC's investment in a single start-up firm is not a creature of the contract between the VC firm and the entrepreneur, but of the contract between the VC firm and the limited partners of the VC fund. In other words, it is a mechanism that derives from a covenant of the VC partnership agreement. Thus, the VC fund's *modus operandi* indirectly contributes to the attainment of the VC firm's screening strategic objective.

Empirical research in the field of VC partnership agreements¹⁴² has shown that there are restrictions on verifiable components of the inefficient behavior that VC firms can develop during the life of the fund¹⁴³. The soft-budget constraint syndrome is

¹⁴¹ Kornai et al., *supra* note 128, 1110

¹⁴² GOMPERS & LERNER, *supra* note 87, 37ff.

¹⁴³ Triantis, *supra* note 76, 313

addressed specifically by putting a cap in the amount that the VC fund can invest in a single venture¹⁴⁴. Usually, this limitation is expressed by means of a threshold in the percentage of the committed capital (: the capital invested in the fund) that can be invested in any one company¹⁴⁵.

In addition to this, VC partnership agreements include provisions that govern the reinvestment of the profits of the fund. VC firms may not reinvest capital gains at their own discretion; most of the time they are required to distribute them to the fund investors¹⁴⁶. Reinvestment is often conditioned on the advisory board's prior approval or is altogether prohibited after a certain date or after a certain percentage of the committed capital is already invested¹⁴⁷. The fund investors have an incentive to negotiate this kind of covenant with regard to the reinvestment of profits not only in order to introduce hard budget constraints in the fund's portfolio management, but also because there is the possibility that the VC firm will want to reinvest in order to increase its management fees. The compensation structure of VC firms consists not only from carried interest (: a flat percentage of a fund's profits on invested capital), but also from management fees that are calculated either on the basis of the value of committed capital or on the basis of the value of managed capital¹⁴⁸. Especially, in the latter case (managed capital)

¹⁴⁴ GOMPERS & LERNER, *supra* note 87, 38: "these provisions are intended to ensure that the general partners do not attempt to salvage an investment in a poorly performing firm by investing significant resources in follow-on funding"; Klausner & Litvak, *supra* note, 61; Triantis, *supra* note 74, 313

¹⁴⁵ GOMPERS & LERNER, *supra* note 87, 38

¹⁴⁶ Klausner & Litvak, *supra* note 85, 61

¹⁴⁷ OREN FUERST & URI GEIGER, FROM CONCEPT TO WALL STREET: A COMPLETE GUIDE TO ENTREPRENEURSHIP AND VENTURE CAPITAL (2002), 216; GOMPERS & LERNER, *supra* note 87, 39

¹⁴⁸ Kate Litvak, *Venture Capital Limited Partnership Agreements: Understanding Compensation Arrangements*, U OF TEXAS LAW AND ECONOMICS RESEARCH PAPER NO. 29; COLUMBIA LAW AND ECONOMICS WORKING PAPER NO. 254, 6ff. Available at SSRN: <http://ssrn.com/abstract=555626>

distributing profits will reduce the management fees¹⁴⁹; thus, the VC firm normally would have the incentive not to distribute, but to reinvest the capital gains, so that these dollar amounts stay under management and can be taken under account for compensation calculation purposes.

This corporate governance structure that ensues from the VC partnership agreement leads indirectly to optimal contracting between the VC firm and the entrepreneur. Entrepreneurs with low-quality projects will not count on the soft-budget problem of the VC and thus will prefer to withdraw from the pool of potential financing recipients. The VC partnership agreement, thus, becomes a determinant of the unraveling result and sets an organizational constraint that renders VC funds in general better positioned as financial intermediaries –than, for example, banks- to fund start-up companies.

III. Infusing Governance through Security Design: Why Convertible Preferred Stock?

A. Venture Capital's Investing Vehicle of Choice: Convertible Preferred Stock

It is well documented in the theoretical¹⁵⁰ and empirical literature¹⁵¹ on venture capital that the most commonly used type of security in US VC financing is convertible preferred stock. This is a remarkable pattern, since in other corporate finance contexts

¹⁴⁹ GOMPERS & LERNER, *supra* note 87, 39 no11

¹⁵⁰ Jeffrey Trester, *Venture Capital Contracting under Asymmetric Information*, 22 JOURNAL OF BANKING AND FINANCE 675; Sahlman, *supra* note 90, 473;

¹⁵¹ Kaplan & Strömberg, *supra* note 100, 287; Gompers, *supra* note 103, 1462

convertible preferred stock seems to be a financial instrument in decline¹⁵², just a small source of financing¹⁵³. It is also at odds with the trend in Canadian and European venture capital financing, where straight debt or straight equity¹⁵⁴ are equally important financial instruments for investing in start-up firms¹⁵⁵.

Convertible preferred stock is a mode of senior participation that provides the VC with a claim on the returns of the start-up firm in the form of a cumulative dividend¹⁵⁶ and also gives it the option to convert the security into common stock¹⁵⁷. In the standardized convertible preferred stock financing term sheets, that VCs commonly use, there are four essential characteristics attached to this type of security: (i) a dividend and liquidation preference; (ii) a redemption right; (iii) convertibility; and (iv) control rights¹⁵⁸. As it has been brilliantly noted, the combination of these elements in a single security creates a regime that could be summarized in the phrase “heads I win, tails you lose”¹⁵⁹; in other words, the VC manages to share in the upside of the investment, but also to get downside protection¹⁶⁰.

¹⁵² William Bratton, *Venture Capital on the Downside: Preferred Stock and Corporate Control*, in VENTURE CAPITAL CONTRACTING AND THE VALUATION OF HIGH TECHNOLOGY FIRMS, *supra* note 84, 108

¹⁵³ Ramanial Pradipkumar et al., *A Simple Approximation of the Value of Callable Convertible Preferred Stock*, 25 FINANCIAL MANAGEMENT 74, 74

¹⁵⁴ KAROLINE JUNG-SENSSEFELDER, EQUITY FINANCING AND COVENANTS IN VENTURE CAPITAL: AN AUGMENTED CONTRACTING APPROACH TO OPTIMAL GERMAN CONTRACT DESIGN (2006), 139

¹⁵⁵ Ulrich Hege et al., *Venture Capital Performance: The Disparity between Europe and the United States*, Working paper (February 8, 2008) available at <http://ssrn.com/abstract=482322>; Douglas Cumming, *The Convertible Preferred Equity Puzzle in Canadian Venture Capital Finance*, Working Paper-Univ. of Alberta (2000), available at <http://jobfunctions.bnet.com/abstract.aspx?docid=69658>; Josh Lerner & Antoinette Schoar, *Transaction Structures in the Developing World: Evidence from Private Equity*, MIT Sloan Working Paper No. 4468-04 (2004), available at SSRN <http://ssrn.com/abstract=511202>

¹⁵⁶ Bratton, *supra* note 152, 109; McCahery & Renneboog, *supra* note 84, 12

¹⁵⁷ Hei Wai Lee & Raymond Figlewicz, *Characteristic of Firms that Issue Convertible Debt versus Convertible Preferred Stock*, 39 QUARTERLY REVIEW OF ECONOMICS AND FINANCE 547, 547

¹⁵⁸ JUSTIN CAMP, VENTURE CAPITAL DUE DILIGENCE: A GUIDE TO MAKING SMART INVESTMENT CHOICES AND INCREASING YOUR PORTFOLIO RETURNS (2002), 138

¹⁵⁹ Edwin Miller et al., *Venture Capital Financings of Technology Companies*, Waltham, MA: Morse, Barnes-Brown & Pendleton, P.C. 2002, 3-21 available at http://www.mbbp.com/resources/business/pdfs/vc_financings_tech.pdf

In the following lines, I provide a brief descriptive overview of the aforementioned four fundamental elements of convertible preferred stock that VCs use, without yet touching upon the corporate governance implications of each element. The overview does not aspire to be comprehensive and analyze all possible variations of these four attributes, but instead presents the most common forms that the latter take in VC contractual packages.

1. Dividend and Liquidation Preference

A preferred stockholder may be granted a right to cumulative or non-cumulative dividend. Under a non-cumulative structure unpaid preferred dividends do not accrue, while under a cumulative structure missed dividend payments remain a liability of the issuer¹⁶¹. In the venture capital context cumulative structures are prevalent when designing convertible preferred stock¹⁶², which means that if the firm skips dividend payments then any dividends to common shareholders will be paid only after the VC has received back the accrued dividends plus the current dividend¹⁶³.

Apart from dividend preference, Kaplan's & Strömberg's seminal survey of the venture capital contracting world¹⁶⁴ showed that 212 out of the 213 rounds of VC financing that were studied featured some form of liquidation preference embedded in the

Nonetheless, such a payoff structure can create the potential for expropriation of the entrepreneurs by VCs, see in general Vladimir Atanasov et al., *VCs and the Expropriation of Entrepreneurs*, Working Paper 2006, available at SSRN <http://ssrn.com/abstract=905923>

¹⁶⁰ Filippo Ippolito, *Convertible Preferred Stock in Venture Capital Financing*, Oxford Financial Research Center Working Paper (September 18, 2007), available at http://www.finance.ox.ac.uk/file_links/finecon_papers/2005fe12.pdf

¹⁶¹ *Seminar on New Ventures: Organization, Financing, and Operations*, 9 DELAWARE JOURNAL OF CORPORATE LAW 253, 275

¹⁶² Klausner & Litvak, *supra* note 85, 64

¹⁶³ Richard Mann, *Starting from Scratch: A Lawyer's Guide to Representing a Startup Company*, 56 ARKANSAS LAW REVIEW 773, 819

¹⁶⁴ Kaplan & Strömberg, *supra* note 100, 286

security issued to the VC¹⁶⁵. With such a preference the VC has a senior priority to all junior stockholders (the entrepreneur and the managers¹⁶⁶) in receiving the proceeds from an event of liquidation (merger, consolidation, change of control etc.) of the start-up firm¹⁶⁷. In other words, upon such an event the VC can recoup its investment before the entrepreneur receives anything from the value of the venture. With regard to this aspect convertible preferred stock held by VCs is a “debtlike”, fixed claim for the amount of the liquidation preference¹⁶⁸. To be more precise, VCs normally have a choice surrounding the liquidity event; they are entitled to whichever of the following two turns out to be the greater in monetary terms: (a) a multiple of the initial purchase price¹⁶⁹ of the preferred stock augmented with the additional accruing, cumulative dividend¹⁷⁰; or (b) the consideration available to them as common shareholders, if they select to convert the preferred stock to common¹⁷¹.

Although regular convertible preferred stock is sufficient for the VC to take precedence over common stockholders in the event of a liquidation, a significant number of VCs bargain for an increased form of liquidation preference attached to a more exotic type of security: the participating convertible preferred stock. In the aforementioned study of Kaplan and Strömberg participating convertible preferred stock appears in 82 of

¹⁶⁵ Klausner & Litvak, *supra* note 85, 64

¹⁶⁶ Steven Kaplan, *What are Firms? Evolution from Birth to Public Companies*, Center for Research in Security Prices, Working Paper No. 603 (2005), 24, available at SSRN <http://ssrn.com/abstract=657721>

¹⁶⁷ JOSEPH BARTLETT ET AL., *ADVANCED PRIVATE EQUITY TERM SHEETS AND SERIES A DOCUMENTS* (2003), 4-5

¹⁶⁸ Klausner & Litvak, *supra* note 85, 65; McCahery & Renneboog, *supra* note 84, 12; Jesse Fried & Mira Ganor, *Agency Costs of Venture Capitalist Control in Startups*, 81 NEW YORK UNIVERSITY LAW REVIEW 967, 982

¹⁶⁹ Richard Mann, *supra* 163, 858

¹⁷⁰ Michael Woronoff & Jonathan Rosen, *Effective vs. Nominal Valuations in Venture Capital Investing*, 2 NEW YORK UNIVERSITY JOURNAL OF LAW AND BUSINESS 101, 120

¹⁷¹ Miller et al., *supra* note 159, 3-21

the 213 financing rounds¹⁷². With the additional participation right, which is embedded in this kind of security, the VC may first receive the cumulative dividend to which it is entitled as a preferred shareholder and then “play again” in the remaining enterprise value by sharing in the residual proceeds of the liquidation on an “as-converted basis”¹⁷³. In other words, the VC does not have to choose between receiving the liquidation preference and converting its preferred stock to common, but can have the best of both worlds by first receiving the principal amount of the preferred stock *and* then sharing in the distributions to the common shareholders on a pro rata basis, as if it were one of them¹⁷⁴. The VC can, thus, enjoy the benefits of converting to common stock without actually having to convert and hence lose its liquidation preference right¹⁷⁵.

2. Redemption Rights

The convertible preferred stock, participating or non-participating, that VCs use for their investments in start-up firms is often called *puttable* convertible preferred because of the redemption right that is customarily attached to it¹⁷⁶. The VC can only realize on its investment upon a liquidity event, but due to provisions in the VC fund partnership agreement it cannot wait for such an event for an indefinite period of time; there is pressure on the VC firm to liquidate the investment within a predetermined

¹⁷² Kaplan & Strömberg, *supra* note 100, 285

¹⁷³ Chun Chang & Huiyan Qiu, *On the Popularity of and a Comparison of Convertible Preferred and Participating Preferred Equities in Venture Financing*, 4 Working Paper (November 14, 2003) available at SSRN: <http://ssrn.com/abstract=537844>

¹⁷⁴ David Denis, *Entrepreneurial Finance: An Overview of the Issues and Evidence*, 10 JOURNAL OF CORPORATE FINANCE 301, 305

¹⁷⁵ BARTLETT ET AL., *supra* note 167, 4-7

¹⁷⁶ Klausner & Litvak, *supra* note 85, 64. In Kaplan’s & Strömberg’s survey redemption provisions are present in 78.7% of the VC financings, *supra* note 100, 292

period of time¹⁷⁷. Thus, the financial contract, embodied in the securities issued to the VC, provides the latter with an additional safeguard to protect its interests¹⁷⁸; an alternative exit strategy. If a liquidity event, such as an IPO or a trade sale, does not take place until a specific point in time (usually because the firm is performing poorly) the VC may put the convertible preferred back to the firm and cash out its investment at the liquidation preference amount¹⁷⁹ (the amount invested plus any cumulative dividends)¹⁸⁰. In other words, the put right provides the VC with guaranteed liquidity. With regard to this aspect convertible preferred stock features another “debtlike” characteristic, since the redemption of the VC’s claim resembles to the repayment of principal to the creditor at the maturity of a debt claim¹⁸¹.

The put right allows the VC to exit a so-called “living dead” investment, namely a self-sustaining firm, which nonetheless does not promise to yield the expected return at the end of the holding period¹⁸². Without this exit option the VC would be locked into an illiquid investment.

3. Convertibility

Consistent with the “heads I win, tails you loose” theme that underlies the design of convertible preferred stock in VC financings, the VC not only wishes to be protected

¹⁷⁷ Miller et al., *supra* note 159, 3-30

¹⁷⁸ Vijay Yerramilli, *Joint Control and Redemption Rights in Venture Capital Contracts*, ECGI – Finance Working Paper no. 37/2004, 1 available at SSRN: <http://ssrn.com/abstract=481362>

¹⁷⁹ Douglas Cumming, *Contracts and Exits in Venture Capital Finance*, 21 REVIEW OF FINANCIAL STUDIES 1947, 1955

¹⁸⁰ In some VC financing contracts the amount, to which the venture capitalist is entitled after exercising the put option is the greater of the liquidation preference amount and the fair market value of the shares; *see* BARTLETT ET AL., *supra* note 167, 4-8 and Kaplan & Strömberg, *supra* note 100, 292

¹⁸¹ Kaplan & Strömberg, *supra* note 100, 292

¹⁸² John Ruhnka et al., *The “Living Dead” Phenomenon in Venture Capital Investments*, 7 JOURNAL OF BUSINESS VENTURING 137

in the downside, but it wants to be able to capture part of the venture's upside gains¹⁸³. Pure preferred stock would prevent it from attaining the latter goal and hence customarily the VC puts a term in the financing contract, pursuant to which it has the option to convert its preferred shares into common shares. VCs have both automatic and voluntary conversion rights¹⁸⁴. In the majority of VC financings preferred stock automatically converts to common immediately before the closing of an underwritten IPO¹⁸⁵; in most cases, though, for this automatic conversion to occur, the IPO price is required to be a specified multiple of the venture's share price at the time of the seed financing. In general, though, such conversion takes place at the option of the VC, usually upon the realization of a trade sale or the reach of a milestone in financial performance¹⁸⁶.

Normally, a VC financing contract will contain some kind of anti-dilution protection with regard to the conversion price and ratio¹⁸⁷. Between the point of the seed financing and the time of –for instance- the IPO other issuances of preferred stock might take place and they will normally be either price-dilutive (when the financing occurs at reduced valuation) or equity-dilutive to the Series A preferred, which were issued to the seed financier¹⁸⁸. Therefore, provisions in the financing contract feature an adjustment formula that establishes a conversion ratio, which helps minimize the dilutive effect of

¹⁸³ Klausner & Litvak, *supra* note 85, 64-65; McCahery & Renneboog, *supra* note 84, 12

¹⁸⁴ CAMP, *supra* note 158, 141

¹⁸⁵ Ippolito, *supra* note 160, 2; Miller et al., *supra* note 159, 3-28; Klausner & Litvak, *supra* note 85, 65; ERIC KOESTER, WHAT EVERY ENGINEER SHOULD KNOW ABOUT STARTING A HIGH-TECH BUSINESS VENTURE (2009), 301

¹⁸⁶ Ippolito, *supra* note 160, 2

¹⁸⁷ Kaplan & Strömberg, *supra* note 100, 290 find that 94.7% of all VC financing rounds in their sample contained some sort of anti-dilution protection.

¹⁸⁸ BARTLETT ET AL., *supra* note 167, 4-7

such down-rounds¹⁸⁹. These mechanisms subject the conversion prices and ratios on either a “ratchet” or “weighted-average” basis. In brief, the former technique allows the shares of the VC to be repriced on the basis of the pricing done by later financiers, so that the conversion ratio of the initial preferred shares can fall automatically to the exact lowest price at which the company issues new shares¹⁹⁰. This adjustment mechanism does not take into account the number of shares issued in subsequent financing rounds and thus ignores the real dilutive effect that new issuances have on Series A; even if a single share is issued in Series B, the “ratchet” automatic adjustment will occur¹⁹¹. Contrarily, the weighted-average formula does allow for the actual impact of the newly issued shares on total capitalization to be taken into consideration when calculating the adjustment of the conversion rate and thus cares both about the price and the number of the shares issued in subsequent financing rounds¹⁹²; under this approach, the conversion price per Series A preferred share is reduced to the weighted-average price of the securities issued¹⁹³.

Anti-dilution provisions help VCs to be more certain of the amount that they are going to receive as a return on their investment in the venture, since in this way they can shield their investment from a decrease in economic value. Therefore, such contractual provisions combined with the liquidation preference and the redemption rights that often

¹⁸⁹ McCahery & Renneboog, *supra* note 84, 12; CAMP, *supra* note 158, 145

¹⁹⁰ CAMP, *supra* note 158, 145; BARTLETT ET AL., *supra* note 167, 4-8

¹⁹¹ Michael Woronoff & Jonathan Rosen, *Understanding Anti-Dilution Provisions in Convertible Securities*, 74 FORDHAM LAW REVIEW 101, 118

¹⁹² Jerome Katzin, *Financial and Legal Problems in the Use of Convertible Securities*, 24 BUSINESS LAWYER 359, 365

¹⁹³ Woronoff & Rosen, *supra* note 191, 119

accompany VC financing convertible preferred stock produce a debt-like payoff structure¹⁹⁴.

4. Control Rights

As it was discussed in Part I (B.3) within the scope of the analysis of the *stricto sensu* incompleteness of contracts, the allocation of control rights is of extreme importance in financing contexts that are characterized by severe informational asymmetries, such as the one of the VC industry. In the empirical VC literature three types of rights fall under the term “control rights”: (i) voting rights; (ii) veto (or negative control) rights; and (iii) board rights¹⁹⁵.

First, VCs typically receive voting rights computed on the basis of the number of common shares, which they would hold if their preferred stock were converted into common¹⁹⁶. Thus, VCs vote their preferred stock with the common shareholders on an as-converted basis¹⁹⁷.

In addition to regular voting rights, VCs typically negotiate for veto rights over major corporate actions¹⁹⁸. These rights, which are included in articles of the firm’s charter known as “protective provisions”¹⁹⁹, provide the VC with the power to block key decisions, such as the sale of the company’s assets²⁰⁰, the timing of the IPO²⁰¹ or any

¹⁹⁴ Ola Bengtsson & Berk Sensoy, *Investor Abilities and Financial Contracting: Evidence from Venture Capital*, March 2009, 1-2 available at SSRN <http://ssrn.com/abstract=1240844>

¹⁹⁵ Kaplan & Strömberg, *supra* note 100, 288

¹⁹⁶ KOESTER, *supra* note 185, 289; Black & Gilson, *supra* note 28, 253

¹⁹⁷ ROBERT WALTER, *FINANCING YOUR SMALL BUSINESS* (2004), 159

¹⁹⁸ Miller et al., *supra* note 159, 3-28

¹⁹⁹ Fried & Ganor, *supra* note 168, 987

²⁰⁰ *Id.*

²⁰¹ Bob Zider, *How Venture Capital Works*, HARVARD BUSINESS REVIEW (November-December 1998) 131, 134

amendments to the charter that would adversely affect its privileges²⁰². Protective provisions are articulated in a way that does not allow the company to proceed with a certain transaction before the consent of a specified percentage of the preferred shareholders is expressly given²⁰³. To be sure though, the VC being alone in the class of preferred shareholders enjoys automatically the statutory privileges of class voting that DGCL §242(b)(2) provides, even if there is no explicit provision in the contract with regard to veto rights.

The extent of the VC's control over the start-up company is a resultant not only of its voting rights, but also of its so-called "board rights"²⁰⁴. A specific percentage of the board seats are reserved for or controlled by the VC, so that the latter is able to monitor more efficiently the firm's operation²⁰⁵. The explicit right of the VC to appoint a specific number of members in the board coupled with its *de facto* power to control the election of the "independent directors" effectively gives it the power to actually initiate major corporate actions, such as trade sales and IPOs²⁰⁶.

B. The Theories of Capital Structure and their Application in VC Financing: Governance Features of Convertible Preferred Stock I

1. Solving the Enigma of Convertible Preferred; Standardization, Mimetic Isomorphism and Corporate Governance

Delivering the foregoing overview of the unique features that convertible preferred stock has in the VC context was feasible because of the large-scale standardization of VC contracts in the US. As a general matter, the phenomenon of

²⁰² KOESTER, *supra* note 185, 289

²⁰³ Miller et al., *supra* note 159, 3-28; Mann, *supra* note 163, 861-862

²⁰⁴ Kaplan & Strömberg, *supra* note 100, 288

²⁰⁵ Fried & Ganor, *supra* note 168, 987

²⁰⁶ *Id.*

standardization of the corporate documentation does provide a plausible explanation of why market participants choose one financial instrument over another. It is true that in this nexus of contracts that the modern corporation is, charters, bond indentures or loan agreements are often not tailored to the specific firm's circumstances, but are picked from a variety of predetermined contractual packages that are easily adaptable for use in cases that share similar characteristics²⁰⁷. Therefore, it is likely that many VCs attach the aforementioned attributes to the securities, with which they invest in start-up ventures, mainly because this is the way the VC industry works²⁰⁸. In other words, the reason why these patterns are observed in a great deal of VC financing rounds could be what institutional theory calls "mimetic isomorphism"²⁰⁹.

While mimetic isomorphism and the correlative phenomenon of standardization provide a plausible explanation for the repetitive character of corporate finance patterns in the VC industry, they cannot explain why these patterns initially developed. As it was noted in the foregoing analysis, the most common practical justification that is put forward for the use of convertible preferred stock by VCs is that it provides both downside protection and significant upside potential²¹⁰.

Although this explanation is perfectly plausible and captures absolutely the essence of a VC investment, it does not account for the corporate governance implications that the use of convertible preferred stock has for start-up firms. To shed light on this aspect of convertible preferred stock, I attempt in this section of the paper to

²⁰⁷ See in general Marcel Kahan & Michael Klausner, *Standardization and Innovation in Corporate Contracting (or "The Economics of Boilerplate")*, 83 VIRGINIA LAW REVIEW 713

²⁰⁸ Barbara Cornelius, *The Institutionalisation of Venture Capital*, 25 TECHNOVATION 59

²⁰⁹ Paul DiMaggio & Walter Powel, *The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields*, 48 AMERICAN SOCIOLOGICAL REVIEW 147, 152

²¹⁰ See e.g. JAMES SCHELL, *PRIVATE EQUITY FUNDS: BUSINESS STRUCTURE AND OPERATIONS* (1999), 1-17

conceptually integrate the use of this financial instrument by VCs into the analytical framework of contract theory that I developed in Part I. To put it differently, my goal in the following analysis is to show that convertible preferred stock is another arrow in the quiver of a VC that helps it cope with the *lato sensu* incompleteness of contracts and as such it is in effect an additional apparatus for corporate governance design in start-up ventures.

A convenient way to show how convertible preferred stock operates as an additional corporate governance institution in VC-backed firms is by first reconciling its function with the axioms of the theories of capital structure that have been put forward in the corporate finance literature.

2. The Modigliani-Miller Capital Structure Irrelevance Theorem and the Rise of the Capital Structure Debate

The cornerstone of modern corporate finance literature and thinking on capital structure is the Modigliani-Miller theorem²¹¹, which postulates: “in an ideal world, where there are no taxes, or incentive or information problems, the way a project or a firm is financed does not matter²¹²”. In other words, when markets are complete the type of securities issued is indifferent and not important for the success of the project or the firm²¹³; the value of the firm will be constant across all financial packages. The

²¹¹ Franco Modigliani & Merton Miller, *The Cost of Capital, Corporation Finance and the Theory of Investment*, 48 AMERICAN ECONOMIC REVIEW 261

²¹² Hart, *Financial Contracting*, 1080

²¹³ Joseph Stiglitz, *A Re-Examination of the Modigliani-Miller Theorem*, 59 AMERICAN ECONOMIC REVIEW 784; Joseph Stiglitz, *On the Irrelevance of Corporate Financial Policy*, 64 AMERICAN ECONOMIC REVIEW 851; David Baron, *Default Risk, Home-Made Leverage and the Modigliani-Miller Theorem*, 62 AMERICAN ECONOMIC REVIEW 176; David Baron, *Default Risk and the Modigliani-Miller Theorem: A Synthesis*, 64 ECONOMIC REVIEW 204; Martin Hellwig, *Bankruptcy, Limited Liability and the Modigliani-Miller Theorem*, 71 AMERICAN ECONOMIC REVIEW 155

argumentum a contrario that derives from the Modigliani-Miller theorem is that in the real world, where there are bankruptcy costs, informational asymmetries and tax subsidies on the payment of interest, financial structure cannot be indifferent for a firm. Consequently, given the imperfection of markets, there will indeed be capital structures that will help the firm and its investors to maximize their utility and capital structures that might render the firm and its financiers worse off; there will be optimal and suboptimal capital structures²¹⁴. This hypothesis has led a great number of authors over the last thirty years to try to develop a theory of the determination of the optimal capital structure.

Several theories of capital structure emerged that attempted to resolve the puzzle of why firms obtain capital through the particular forms that were observed for such long periods of time. Various models were proposed to explain the driving forces behind capital structure patterns: models based on taxation considerations, on differing expectations among investors²¹⁵, on private information²¹⁶, on incomplete markets and transaction costs²¹⁷, even models that focused on wealth constraints and the transfer of control in bankruptcy²¹⁸.

The common underlying theme of all the theories of capital structure was the effort to determine how to optimally partition the cash flows from the firm's assets across

²¹⁴ Alan Kraus and Robert Litzenberger, *Market Equilibrium in a Multiperiod State Preference Model with Logarithmic Utility*, 30 JOURNAL OF FINANCE 1213; Peter Lloyd-Davies, *Optimal Financial Policy in Imperfect Markets*, 10 JOURNAL OF FINANCIAL AND QUANTITATIVE ANALYSIS 457

²¹⁵ Armen Alchian & Harold Demsetz, *Production, Information Costs, and Economic Organization*, 52 AMERICAN ECONOMIC REVIEW 777

²¹⁶ Robert Townsend, *Optimal Contracts and Competitive Markets with Costly State Verification*, 21 JOURNAL OF ECONOMIC THEORY 265; Diamond, *supra* note 79, 393; Douglas Gale & Martin Hellwig, *Incentive Compatible Debt Contracts: The One-Period Problem*, 52 REVIEW OF ECONOMIC STUDIES 647;

²¹⁷ Franklin Allen & Douglas Gale, *Optimal Security Design*, 1 REVIEW OF FINANCIAL STUDIES 229

²¹⁸ Jaime Zender, *Optimal Financial Instruments*, 46 JOURNAL OF FINANCE 1645

financial claims with different characteristics²¹⁹. In the beginning, these theories constrained the scope of the capital structure decision by basing it on the dichotomous choice between debt and equity²²⁰, which in this framework were both viewed as standardized, exogenously given securities²²¹. For a long period of time the financial structure decision was simply a question of the optimal mix of traditional debt and equity²²². Nonetheless, the development of financial engineering and innovation²²³ softened the differentiation between the two paradigm instruments in the corporate finance literature and demonstrated that corporate securities should not be viewed as necessarily exogenous²²⁴. Financial innovation and contracting flexibility²²⁵ indicated that firms can attain their financial and strategic goals not only by trying to compose the optimal financial package through the choice among a finite array of exogenous instruments, but also by going one logical step back in the financing process and endogenously tailor the financial contracts, which the various corporate securities represent, so as to meet their needs²²⁶. Especially, the emergence during the 80s of hybrid instruments, such as puttable common stock, puttable convertible bonds, adjustable rate

²¹⁹ Arnoud Boot & Anjan Thakor, *Security Design*, 48 JOURNAL OF FINANCE 1349, 1349

²²⁰ Alexander Triantis & George Triantis, *Conversion Rights and the Design of Financial Contracts*, 72 WASHINGTON UNIVERSITY LAW QUARTERLY 1231, 1231

²²¹ Milton Harris & Artur Raviv, *The Role of Games in Security Design*, 8 REVIEW OF FINANCIAL STUDIES 327, 328

²²² Triantis & Triantis, *supra* note 220, 1231; Milton Harris & Artur Raviv, *Financial Contracting Theory*, in ADVANCES IN ECONOMIC THEORY: SIXTH WORLD CONGRESS vol. II (J.-J. LAFFONT ed., 1992), 65; JONATHAN BASKIN & PAUL MIRANTI, A HISTORY OF CORPORATE FINANCE (1999), 15

²²³ Triantis, *supra* note 91, 103

²²⁴ Franklin Allen & Douglas Gale, *Optimal Security Design*, 1 REVIEW OF FINANCIAL STUDIES 229, 229-230

²²⁵ Triantis & Triantis, *supra* note 220, 1231

²²⁶ Harris & Raviv, *supra* 221, 328; Harris & Raviv, *supra* note 222, 65

preferred stock²²⁷, liquid yield option notes (LYONs)²²⁸ etc., paved the way for firms to stop struggling with mixing debt and equity and to create value by overcoming the financial barriers that they faced. Thus, the attention of financial economists shifted from optimal capital structure to optimal security design.

The main implication of blending the theories of capital structure with the concept of security design was the acknowledgment of the fact that the securities issued by a firm do not only have cash flow features, but also governance features²²⁹. The roots of this approach are found in an article written by Oliver Williamson²³⁰, who in the framework of the discussion of the traditional dichotomy between debt and equity noted that these two should not be treated as alternative financial instruments, but rather as alternative governance structures²³¹. Security design is a process that does not merely tailor financial instruments, so as to help investors with different risk preferences to meet their investment goals, but is also a means to attain corporate governance objectives.

Harris and Raviv have conducted a comprehensive survey of the numerous theories of capital structure that have been put forward and they have identified that there are overall four categories of potential determinants of capital structure²³². Of these four categories, I choose to examine two as particularly relevant for the venture capital

²²⁷ For an overview of the various corporate securities that emerged in the 80s as a result of a boom in financial engineering see John Finnerty, *Financial Engineering in Corporate Finance: An Overview*, 17 FINANCIAL MANAGEMENT 14, 17; For a more recent survey of innovative financial instruments see John Finnerty, *Corporate Securities Innovation: An Update*, 12 JOURNAL OF APPLIED FINANCE 21

²²⁸ LYONs were developed by Merrill Lynch and were puttable convertible zero coupon bonds that provided investors with a package of debt and stock options; see in general John McConnell & Eduardo Schwartz, *The Origin of LYONs: A Case Study in Financial Innovation*, 4 JOURNAL OF APPLIED CORPORATE FINANCE 40

²²⁹ Triantis, *supra* note 91, 103; Triantis & Triantis, *supra* note 220, 1232

²³⁰ Oliver Williamson, *Corporate Finance and Corporate Governance*, 48 JOURNAL OF FINANCE 567, 567, 572

²³¹ *Id.*; see also Aghion & Bolton, *supra* note 39, 474

²³² Milton Harris & Artur Raviv, *The Theory of Capital Structure*, 46 JOURNAL OF FINANCE 297, 297

financing setting: the one that views a firm's capital structure as an agency-cost mitigating mechanism and the one that considers it as a signaling mechanism. But, before engaging in their analysis, I believe that a brief reference to a distinct set of capital structure theories that rely on tax considerations is useful as a starting point for the discussion. The goal is not to describe in a comprehensive way the tax benefits of the use of convertible preferred stock, but rather to give the reader a sense of the role that tax considerations can play in an investor's choice of security for investment and in the design of a start-up firm's capital structure.

3. Taxation and Capital Structure Choice; The Tax Effects of Convertible Preferred Stock in VC-backed firms

Modigliani and Miller were again the first that attempted to establish a theory that defines an optimal capital structure²³³. Their model was based on tax considerations; on the existence of taxation benefits for certain financial instruments. They indicated that because of the favorable tax treatment of interest payments²³⁴, the value of the firm will rise as the level of substitution of debt for equity financing rises; a leveraged structure maximizes the value of the tax shield. However, as they acknowledge in the end of their paper²³⁵, their argument is most likely deficient in the sense that it does not explain why firms are not capitalized exclusively with debt, given that it is supposed to be so advantageous²³⁶.

²³³ Franco Modigliani & Merton Miller, *Corporate Income Taxes and the Cost of Capital: A Correction* 53 AMERICAN ECONOMIC REVIEW 433

²³⁴ Debt payments are excluded from income in computing corporate income tax.

²³⁵ Modigliani & Miller, *supra* note 233, 442; *see also* EUGENE FAMA & MERTON MILLER, *THE THEORY OF FINANCE* (1972), 172 and Jensen & Meckling, *supra* note 19, 332-333

²³⁶ Several years after Modigliani and Miller praised "sole debt" capital structures, Gilson and Whitehead provided a different reason, why such structures are optimal; Ronald Gilson & Charles Whitehead,

Although taxation considerations fall largely outside the scope of the discussion on corporate governance, there is no doubt that companies do respond to taxation conditions with their financing and investment decisions²³⁷. It is highly unlikely that a firm's capital structure will not be affected at least partially by some tax rules that subsidize the use of a particular financial instrument over another. Consequently, it comes as no surprise that some authors have put forward a tax explanation for the use of convertible preferred stock in VC financings²³⁸.

Their starting point is the fact that convertible preferred stock is not the financial instrument of choice in other developed economies²³⁹. Therefore, there must be some US-specific reason for the use of convertible preferred stock by VC firms. To be more precise, advocates of this opinion assert that if convertible preferred stock were truly the best way to cope with the problems of incomplete contracting –as I will try to show in the parts to follow- then its use would be universal and not constrained within the US²⁴⁰. Thus, tax rules might constitute a domestic variable that should be examined as a potential determinant of the choice of convertible preferred stock for the financing of start-up firms.

Deconstructing Equity: Public Ownership, Agency Costs, and Complete Capital Markets, 108 COLUMBIA LAW REVIEW 231. The two authors postulated that risk management can substitute for risk capital that shareholders offer and therefore equity financing is expected to be gradually “deconstructed” in the sense that an increasing number of firms will prefer to go private and be capitalized almost exclusively with debt, while using sophisticated risk management techniques to enjoy the benefits that equity financing used to offer.

²³⁷ Thiess Buettner et al., *Taxation and Capital Structure Choice – Evidence from a Panel of German Multinationals*, ZEW Discussion Paper No. 06-067, 1 available at SSRN <http://ssrn.com/abstract=935219>

²³⁸ Sahlman, *supra* note 90, 510; Ronald Gilson & David Schizer, *Understanding Venture Capital Structure: A Tax Explanation for Convertible Preferred Stock*, 116 HARVARD LAW REVIEW 874

²³⁹ See Hege et al., *supra* 155; Cumming, *supra* 155; Lerner & Schoar, *supra* 155; Armin Schwienbacher, *Venture Capital Investment Practices in Europe and in the United States*, 22 FINANCIAL MARKETS AND PORTFOLIO MANAGEMENT 195

²⁴⁰ Gilson & Schizer, *supra* note 238, 888; However, as it will be shown in Part IV the use of convertible preferred stock does exist in other countries, but it is not the ubiquitous security of choice.

A careful look at US tax law reveals that the use of convertible preferred stock can help reduce the tax that managers of the start-up firm have to pay on their equity-based compensation. A lower tax burden on the manager of the venture for the stock options she receives as a consideration for her services helps the incentivizing effect of equity-based executive compensation not to be weakened.

Here is how convertible preferred stock becomes part of an efficient tax planning: the firm's managers are provided with unvested stock options as part of their compensation. Given the compensatory character of this arrangement, the manager is obligated to pay tax at the income tax rate for these stock options. The amount of tax to be paid is computed on the basis of the grant-date value of the stock²⁴¹. Thus on the one hand, for tax purposes it is beneficial for the manager to report a low grant-date stock value²⁴². On the other hand, for financial purposes she wants the stock valuation to be as high as possible, because this will affect the amount of funds that will flow into the company as a result of the VC's investment²⁴³. The solution, in order to attain both goals, is to finance the company not through the purchase of common stock, but through the purchase of preferred stock. The price paid by the VC for the latter does not signify the exact value of the common stock, since the two types of securities have different payoff structures that lead to a different valuation; convertible preferred allows for a higher and more certain return on the investment and thus it is necessarily priced more favorably than common stock, which with an aggressive tax-reporting position can be reported at a

²⁴¹ 26 U.S.C. § 83(a)

²⁴² Fried & Ganor, *supra* 168, 984

²⁴³ Gilson & Schizer, *supra* 238, 890

lower value than the actual one²⁴⁴. As a result the manager is able to report a low taxable income at the grant date, when she will be taxed on the basis of the high income tax rate and when the share will appreciate in value in the future, she will be able to report the profits as capital gains and thus be taxed for the greatest portion of her compensation at a lower tax rate²⁴⁵.

However, as it is evident from the structure of the foregoing scheme, only the manager benefits from tax savings, while the VC as a taxpayer does not enjoy any advantage. For the VC this whole tax planning is in essence another corporate governance mechanism, namely another way to attain the goal of aligning the manager's objectives with its own interests. As it was mentioned above, this tax scheme allows the incentive attributes of the equity-based compensation not to be watered down. If a significant portion of the incentive compensation that the manager receives had to be paid to the IRS, then its incentive effects would become weaker and the difference between stock options and a fixed salary would be negligible. But, by using convertible preferred stock as the vehicle of investment, the VC manages to preserve the incentivizing power of stock options, which is very important to cope with the problem of moral hazard. In essence, the tax device that convertible preferred stock puts in place indirectly helps an important corporate governance institution not to lose its value.

²⁴⁴ Fried & Ganor, *supra* 168, 985

²⁴⁵ Gilson & Schizer, *supra* note 238, 889-890

4. Capital Structure as an Agency Cost-Mitigating Mechanism

i. The disciplining effects of debt

The first group of theories of capital structure identifies the desire to alleviate conflicts of interest among the members of the firm as the driving force behind the choice of a capital structure by a firm. The equilibrium capital structure is determined so as to minimize the sum of agency costs²⁴⁶; the corporate finance patterns of a firm are designed in such a way, so that the problems of moral hazard can be mitigated. The most cited paper in this group of theories of capital structure is actually the same paper that introduced the notion of agency costs and established the contractarian approach to the firm: Jensen's and Meckling's *Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure*²⁴⁷. The paper explains the financial structure of a firm on the basis of the incentives that return patterns associated with different financial instruments trigger to the managers²⁴⁸. Debt contracts reduce the amount of free cash flows available to managers by requiring the company to make fixed payments at specified dates. In general, the intervention of creditors binds managers to delivering targeted levels of performance. Given that free cash flows are traditionally considered as a source of agency costs, it follows that the existence of debt in a firm's financial structure can contribute to the reduction of agency costs and hence to the maximization of the firm's

²⁴⁶ Martin Hellwig, *A Reconsideration of the Jensen-Meckling Model of Outside Finance*, MPI Collective Goods Preprint No. 2007/8, 2. Available at SSRN: <http://ssrn.com/abstract=991079>

²⁴⁷ Jensen & Meckling, *supra* note 19, 305. Other papers that view the capital structure of a firm as a result of the desire to control agency costs within the firm include Milton Harris & Artur Raviv, *Capital Structure and the Informational Role of Debt*, 45 JOURNAL OF FINANCE 321; Rene Stulz, *Managerial Discretion and Optimal Financing Policies*, 26 JOURNAL OF FINANCIAL ECONOMICS 3; David Hirshleifer & Anjan Thakor, *Managerial Conservatism, Project Choice and Debt*, 5 REVIEW OF FINANCIAL STUDIES 437

²⁴⁸ Hellwig, *supra* note 246, 2

value²⁴⁹. Removing free cash from the corporation means removing an opportunity for the insiders to inflate their private benefits²⁵⁰.

However, while a highly leveraged structure mitigates the conflicts of interest between managers and equityholders, it acerbates the conflict between debtholders and equityholders²⁵¹. Debt contracts assign priority to debtholders over equityholders in the sense that equityholders cannot get a return on their investment until after the debtholders' claim is satisfied²⁵²; the payment of a dividend before the payment on the loan is prohibited. It is in this way that the contractual structure of the firm renders equityholders the residual claimants. From this structure it follows that in the presence of debt the value of equity is like an option²⁵³ (whose value is an increasing function of the variance of the underlying asset²⁵⁴), so that equityholders have the incentive to increase the risk of the firm by investing in risky projects that have the potential of yielding a large return and leaving some residue for them to catch; equityholders can only benefit from such an investment, since they capture the upside, but should the project fail, they will not suffer any loss. Thus, a leveraged capital structure might result in the firm exchanging its low-risk assets for high-risk investments²⁵⁵, even if this reduces the NPV

²⁴⁹ Michael Jensen, *Agency Costs of Free Cash Flow, Corporate Finance and Takeovers*, 76 AMERICAN ECONOMIC REVIEW 323, 323-324; Michael Jensen, *Eclipse of the Public Corporation*, 67 HARVARD BUSINESS REVIEW 61, 61; Triantis, *supra* note 91, 95

²⁵⁰ Triantis, *supra* 76, 318

²⁵¹ Harris & Raviv, *supra* note 222, 68

²⁵² Triantis & Triantis, *supra* note 220, 1232

²⁵³ It is in essence a call option in the sense that shareholders have the option to buy back the underlying assets of the firm from the debtholders; IAN AYRES, *OPTIONAL LAW: THE STRUCTURE OF LEGAL ENTITLEMENTS* (2005), 2

²⁵⁴ Fischer Black & Myron Scholes, *The Pricing of Options and Corporate Liabilities*, 81 JOURNAL OF POLITICAL ECONOMY 637, 637

²⁵⁵ See in general David Mauer & Sudipto Sarkar, *Real Options, Agency Conflicts and Optimal Capital Structure*, 29 JOURNAL OF BANKING AND FINANCE 1405

of the firm as a whole²⁵⁶. Projects with positive NPV may be abandoned, if their only benefit accrues to the debtholders²⁵⁷. Thereupon, the equity cushion, upon which debtholders relied when they extended credit to the firm, is gone leaving both the creditors and the common shareholders worse off²⁵⁸. In finance theory this is known as the “asset substitution problem” and is considered to be an agency cost of debt financing²⁵⁹ that counterbalances its benefits.

ii. Replicating the incentive-compatible cash flow structure of debt with convertible preferred stock; Placing convertible preferred on the debt-equity continuum

Given that the highly uncertain environment of VC financing gives rise to increased agency problems, VCs will be keen on designing a capital structure for the VC-backed firm that will embrace the philosophy of this first group of theories²⁶⁰. In order to cope with the problem of moral hazard, VCs are expected to use the financial structure of the firm as a mechanism that complements the other incentive schemes that are used to discipline managers²⁶¹. After all, it is well documented in literature that the interaction between securities and incentives is central to VC financial planning²⁶².

²⁵⁶ Richard Green, *Investment Incentives, Debt and Warrants*, 13 JOURNAL OF FINANCIAL ECONOMICS 115, 115

²⁵⁷ Stewart Myers, *Determinants of Corporate Borrowing*, 5 JOURNAL OF FINANCIAL ECONOMICS 147, 149

²⁵⁸ Clifford Smith & Jerold Warner, *On Financial Contracting: An Analysis of Bond Covenants*, 7 JOURNAL OF FINANCIAL ECONOMICS 117, 118-119

²⁵⁹ Harris & Raviv, *supra* note 222, 69

²⁶⁰ The fact that agency problems between the entrepreneur and the venture capitalist are very important determinants of venture financing contract designs and hence of the capital structure that will ensue from this contract is emphasized by Steven Kaplan and Per Strömberg, *Characteristics, Contracts and Actions: Evidence from Venture Capitalist Analyses*, 59 JOURNAL OF FINANCE 2177, 2178

²⁶¹ Mathias Dewatripont & Jean Tirole, *A Theory of Debt and Equity: Diversity of Securities and Manager-Shareholder Congruence*, 109 QUARTERLY JOURNAL OF ECONOMICS 1027, 1027

²⁶² Rafael Repullo & Javier Suarez, *Venture Capital Finance: A Security Design Approach*, 8 REVIEW OF FINANCE 75, 78

A first option for VCs would be to take advantage of the disciplining effect that debt has and thus purchase debt instruments for their investment in a start-up firm. However, as it has been noted in the VC literature²⁶³, straight debt is an inappropriate vehicle of investment in firms that are in the initial stages of development; among other reasons, because these ventures do not generate sufficient working capital to repay a loan and because their value is locked in growth options rather than in tangible assets that can be foreclosed on, if the firm defaults on the repayment of the loan²⁶⁴. In general, debt capital is only suitable for companies with earnings and assets²⁶⁵. Contrarily, equity capital can absorb uncertainty more easily²⁶⁶.

Apart from the economic unsuitability of debt for VC investments, there is also a legal risk associated with debt: unlimited liability of the creditor. If the VC used straight debt for its investment in the entrepreneurial firm, then it wouldn't be able to attach to its security all these control rights that were discussed above without running the risk of being found itself liable for the liabilities of the firm. As the Restatement Second of Agency section 14 (O) puts it: "A creditor who assumes control of his debtor's business for the mutual benefit of himself and his debtor, may become principal". Based on this concept several courts have in the past characterized a creditor as the principal and the

²⁶³ DOUGLAS CUMMING & SOFIA JOHAN, VENTURE CAPITAL AND PRIVATE EQUITY CONTRACTING (2009), 402; Triantis, *supra* note 71, 318

²⁶⁴ Josh Lerner, *Venture Capitalists and the Oversight of Private Firms*, 50 JOURNAL OF FINANCE 301, 302

²⁶⁵ Mann, *supra* note 163, 817

²⁶⁶ Maria Brouwer & Bart Hendrix, *Two Worlds of Venture Capital: What Happened to U.S. and Dutch Early Stage Investment?*, 10 SMALL BUSINESS ECONOMICS 333, 333

debtor as the agent, when the former dominates the latter to the extent that the borrowing firm functions solely to achieve the purposes of the dominant lender²⁶⁷.

Thereupon, the ubiquitous security used for investment in start-up firms is not debt, but convertible preferred stock; a hybrid security that represents a combination of debt and equity interests²⁶⁸. A financial instrument that shares elements of both paradigm debt and paradigm equity²⁶⁹. Just like for any other hybrid security, the question that arises in this context is whether the convertible preferred stock that VCs use resembles more to debt or equity. If the range of existent corporate securities would be represented by means of a continuum that has straight debt at the one extreme and straight equity at the other, where exactly would convertible preferred stock lie? Can this type of hybrid security replicate the incentive-compatible allocation of the cash flow rights of debt? What debtlike characteristics does it have that can potentially produce some of the disciplining effects that straight debt has on management?

In response to the foregoing questions I will attempt to identify whether the cash flow patterns associated with the convertible preferred stock that VCs use can provide managers of the start-up venture with the incentives that debt does according to Jensen's and Meckling's model. To put it differently, the main goal of the following analysis is to

²⁶⁷ See Margaret Hambrecht Douglas-Hamilton, *Creditor Liabilities Resulting from Improper Interference with the Management of a Financially Troubled Debtor*, 31 BUSINESS LAWYER 343; See also *Jenson Farms Co. v. Cargill, Inc.*, 309 N.W.2d 285 (Minn 1981) and *K.M.C. Co., Inc. v. Irving Trust Co.*, 757 F.2d 752 (6th Circ. 1985)

²⁶⁸ RICHARD HARROCH, *START-UP & EMERGING COMPANIES: FINANCING & OPERATING THE SUCCESSFUL BUSINESS* (2000), §1.05

²⁶⁹ Triantis, *supra* note, 71, 318; The term "paradigm equity" is used by Standard & Poor's in *Corporate Criteria-Equity Credit: What it is, and How you Get it. Factoring Future Equity into Ratings. Tax Deductible Preferreds and Other Hybrids. A Hierarchy of Hybrid Securities* (2005), 1 (on file with author)

check whether convertible preferred stock can replicate the corporate governance implications of debt in the start-up firm's capital structure.

A superficial approach of the issue would suggest that convertible preferred stock establishes a payoff structure that is closer to common equity rather than to paradigm debt. To be sure, in the corporate finance literature one can locate continua that look like the following (Figure 1)²⁷⁰:

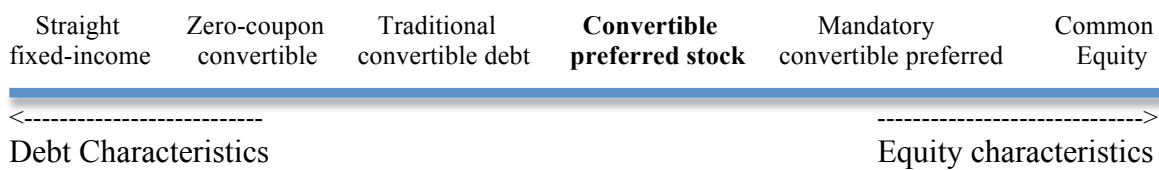


Figure 1

This depiction might well be plausible for the *typical* convertible preferred stock that investors can find in the public securities markets, but is probably not accurate with regard to the idiosyncratic convertible preferred stock that VC-backed firms issue to VCs and that we described above under III.A. In fact, as it will become evident in the lines to follow, the VC convertible preferred purports to be more debtlike or at least appears to be conducive, through the *suis generis* contractual rights attached to it, to produce the incentives that pure debt produces.

To substantiate my argument, I am going to use insights from the analytical framework that the rating agency Moody's has established in order to classify publicly

²⁷⁰ This figure is based on the one provided by NICK CALAMOS, *CONVERTIBLE ARBITRAGE* (2003), 26

traded hybrid securities into equitylike and debtlike²⁷¹. Despite the fact that Moody's methodology is employed to assess the character of hybrid securities that are traded in public securities exchanges, it is my strong conviction that the criteria used for this classification can be applied even in our case, where we seek to identify the character of a security issued by a private firm²⁷².

Moody's has established a continuum of five baskets (A-E). Securities that belong to basket A are treated as 0% equity and 100% debt. At the other extreme securities assigned to basket E are treated as 100% equity and 0% debt. The rest of the hybrid securities are classified into intermediate baskets on the basis of their equitylike or debtlike features²⁷³. To accomplish this task the security in question is broken down into its basic characteristics, which are then compared to the following three attributes of paradigm equity: (i) no ongoing payments; (ii) no maturity; and (iii) significant loss absorption. The hybrid securities are subsequently scored based on the strength of their resemblance to pure common equity. The more remote their features are compared to the three foregoing characteristics, the more debtlike is the instrument.

To identify whether the idiosyncratic convertible preferred stock that VCs use is close to common equity or not, I analyze briefly each of these three elements in turn and then I seek the points of intersection or points of divergence between convertible preferred and equity.

²⁷¹ See New Instruments Standing Committee (Moody's Investors Service), *Rating Methodology. Moody's Tool Kit: A Framework for Assessing Hybrid Securities* (Dec. 1999), reproduced in *BALANCE SHEET STRUCTURES* (A. BIRTS ed.) (2001), 144ff.

²⁷² For an attempt to assign preferred stock a position on the debt-equity continuum on the basis of a risk-and-return analysis from finance theory see Anthony Polito, *A Modest Proposal Regarding Debt-like Preferred Stock*, 20 VIRGINIA TAX REVIEW 291, 322

²⁷³ US Patent Application No. US2006/0287938 A1, at [1] (pub. date: Dec. 21, 2006)

No ongoing payments: A fundamental element of common equity is that the issuer can skip a dividend payment without triggering an event of default. This provides the issuer with substantial financial flexibility, which is particularly valuable in periods of financial distress or in the initial stages of development. As far as VC-style convertible preferred stock is concerned, there is no doubt that it entitles its holder to dividends, which means that in principle there is no contractual obligation for the start-up firm to make a fixed payment. Nonetheless, the fact that in the VC context this security usually has cumulative rights to dividends attached to it significantly compromises the benefits of financial flexibility. If the purpose of VC-style convertible preferred was to replicate common stock more closely, then the parties should have agreed upon a non-cumulative structure rather than upon a cumulative one²⁷⁴. With the liability of accrued dividend hanging over the firm, the managers do not have so much the incentive to accumulate cash and liquid assets (free cash flows), which will give them greater discretion over future decisions²⁷⁵. Therefore, the agency costs associated with free cash flows are somewhat reduced due to the existence of cumulative dividends.

No maturity (no principal repayment): Paradigm equity does not give the security holder the right for repayment in full. “Common stock does not have to be repaid”²⁷⁶. There is no fixed claim on the firm’s cash flow, like there is in the case of a debt claim, where a demand for repayment of the principal exists. Again, the practice of VC financings has undermined this attribute of common stock, since the redemption right attached to the convertible preferred stock makes the issuer face “a potentially major

²⁷⁴ New Instruments Standing Committee (Moody’s Investors Service), *supra* note 249, 149

²⁷⁵ Triantis, *supra* 91, 95

²⁷⁶ New Instruments Standing Committee (Moody’s Investors Service), *supra* note 249, 147

claim on cash flow, similar to the payment in full of an obligation due at maturity”²⁷⁷. Consequently, the potential for the managers to accumulate a pool of liquid reserves with all its resultant problems is reduced, much like it happens in companies with highly leveraged structures.

Significant loss absorption: Common shareholders absorb the risk of a potential performance shortfall by means of their position as residual claimants of the firm²⁷⁸. As they have contracted for the rights to net cash flows²⁷⁹, they have undertaken the risk of any distressed situation. Their claim is subordinated to all other claims on the firm’s assets. VCs as preferred shareholders are never found in this situation, since they have seniority over common stockholders with regard to dividend payments and distribution of assets in the case of liquidation; unpaid accrued dividends must be paid before any value is paid out to common shareholders²⁸⁰.

This income stream attached to preferred stock is itself actually an incentive scheme for the managers²⁸¹; an incentive scheme identical to the one that a debt payoff structure creates. The founder and the managers, holders of the common stock, know that, if the firm does poorly then they will either get less than their pro rata share of the company’s value or even nothing, if this value is less than the liquidation preference²⁸². Thus, much like when there is debt in the capital structure, the managers-equityholders have an increased incentive to build value for the firm. In other words, shifting the

²⁷⁷ *Id* at 150; see also text accompanying note 178

²⁷⁸ Polito, *supra* note 272, 321-322

²⁷⁹ Eugene Fama & Michael Jensen, *Agency Problems and Residual Claims*, 26 JOURNAL OF LAW & ECONOMICS 327, 328

²⁸⁰ Francesca Cornelli & Oved Yosha, *Stage Financing and the Role of Convertible Securities*, 70 REVIEW OF ECONOMIC STUDIES 1, 2

²⁸¹ Dewatripont & Tirole, *supra* note 261, 1028

²⁸² Fried & Ganor, *supra* 168, 983

residual risk on the managers by means of the use of preferred stock reduces entrepreneurial opportunism and increases the managers' incentive to create value²⁸³.

Nevertheless, the dividend and liquidation preference that preferred stock carries might result in the asset substitution syndrome that is caused by managers, who want to maximize the value of their residual claim while financing operations with senior instruments²⁸⁴. Similar to what happens, when the firm has debt obligations, the managers, whose compensation is partially equity-based, might want to engage in highly risky projects hoping that, should they succeed, there will be in the end some value left to be distributed to them. At this point is where convertible preferred stock proves itself superior as a corporate governance mechanism when compared to straight debt, because not only it is conducive to generate the same beneficial corporate governance implications that debt does, but it can also shield the company from these problems of risk alteration²⁸⁵. The latter is accomplished by means of the convertibility feature attached to the security. The put component impedes the distortionary risk-taking incentives of managers, since they know that, even if their risky project succeeds, the VC might convert its preferred into common and thus they will have to share the payoffs with the VC²⁸⁶. Convertible preferred stock reduces the manager's share, when high profit is realized and thus makes excessive risk taking less appealing²⁸⁷.

All in all, the idiosyncratic convertible preferred stock that VCs use as a vehicle for their investment in start-up firms purports to be more debtlike rather than equitylike,

²⁸³ Sahlman, *supra* note 90, 510

²⁸⁴ Green, *supra* note 256, 116

²⁸⁵ Triantis, *supra* note 76, 319

²⁸⁶ Jensen & Meckling, *supra* note 19, 354; Green, *supra* note 241, 125

²⁸⁷ See Green, *supra* note 255, 117ff.

if one uses the criteria that Moody's Tool Kit puts forward for assessing the character of hybrid securities. The cash flow structures associated with VC-style convertible preferred stock are conducive to replicate the income streams attached to debt instruments and thus the start-up firm is able to benefit from the disciplining effects that debt has according to Jensen and Meckling. In addition to this, convertible preferred stock appears to mitigate to a certain extent the asset substitution effect that might arise in firms with highly leveraged structures and thus one could postulate that while it promotes the beneficial corporate governance implications of debt, it prevents the unraveling of the latter's detrimental effects. Consequently, convertible preferred stock proves to be an efficient corporate governance mechanism that addresses satisfactorily the problems caused by moral hazard, one of the three major dimensions of the *lato sensu* incompleteness of contracts.

5. Capital Structure as a Signaling Mechanism

i. Leverage signaling models

The second group of theories of capital structure views a firm's capital structure as a response to the problem of adverse selection that can arise in financial markets due to asymmetric information. Insiders possess more information about the firm's assets and investment opportunities than outside potential capital suppliers. For many authors²⁸⁸, a

²⁸⁸ See e.g. Leland & Pyle, *supra* note 65; Stephen Ross, *The Determination of Financial Structure: The Incentive Signalling Approach*, 8 BELL JOURNAL OF ECONOMICS 23; Myers & Majluf, *supra* note 59; Robert Heinkel, *A Theory of Capital Structure Relevance under Imperfect information*, 37 JOURNAL OF FINANCE 1141; Kose John, *Risk-shifting Incentives and Signaling through Corporate Capital Structure*, 42 JOURNAL OF FINANCE 623; George Blazenko, *Managerial Preference, Asymmetric Information, and Financial Structure*, 42 JOURNAL OF FINANCE 839; Theo Vermaelen, *Repurchase Tender Offers, Signalling, and Managerial Incentives*, 19 JOURNAL OF FINANCIAL AND QUANTITATIVE ANALYSIS 163; Ivan Brick et

firm's choice of a specific capital structure signals to market participants the private information that insiders have about the quality of the firm²⁸⁹. By looking at a company's financial structure, investors can draw inferences about the firm's profit profile. In other words, one of the driving forces behind a firm's determination of its financial composition is its desire to convey private information to the market about its expected earnings and thus signal its type. Authors in this set of approaches to the theory of capital structure have identified equity as a negative signal and debt as a positive one. In the majority of models put forward in the literature, there is a positive correlation between firm quality and leverage.

The issuance of equity is viewed by market participants as a signal that the firm's equity is overvalued²⁹⁰. This assertion is backed by event studies that show that the announcement of equity issues is associated with negative event returns²⁹¹. To the contrary, a higher proportion of debt is perceived as a signal of higher quality and, therefore, should the firm decide to issue more of it, its weighted cost of capital is expected to be reduced²⁹².

Among the several debt signaling models that are proposed in theory, I have chosen to refer to two; one that cannot be applied in the VC context and one that can be applied. The non-applicable model will help illustrate more the nature of convertible preferred stock and the fact that although it can replicate some of the corporate governance implications of debt, it cannot be a complete substitute for debt in all aspects.

al., *Asymmetric Information Concerning the Variance of Cash Flows: The Capital Structure Choice*, 39 INTERNATIONAL ECONOMIC REVIEW 745

²⁸⁹ Harris & Raviv, *supra* note 221, 80

²⁹⁰ Myers & Majluf, *supra* note 59, 188, 209-210

²⁹¹ ROBERT BRUNER, APPLIED MERGERS & ACQUISITIONS (2004), 572

²⁹² Harris & Raviv, *supra* note 222, 85

By means of the applicable model it will be demonstrated that convertible preferred stock apart from being valuable for dealing with moral hazard problems, is also a significant arrow in the quiver of VCs to address the problem of adverse selection, the other dimension of the incompleteness of contracts.

According to the first of the two approaches, the reason why debt is viewed as conveying such favorable information is that as the level of debt increases, the risk of insolvency increases as well and thus the company faces a higher probability of having to cope with the various costs surrounding the event of bankruptcy; given that lower quality firms incur necessarily higher expected bankruptcy costs, they will naturally be deterred from using highly leveraged structures, whereas the remoteness of the event of bankruptcy for high quality firms lowers their expected bankruptcy costs thus allowing them to issue more debt²⁹³. Hence, low quality firms find it more costly to incur higher levels of debt, than do firms with higher expected cash flows, for which bankruptcy is less likely²⁹⁴. High quality firms can send a credible signal to market participants by loading their capital structure with more debt, while low quality firms (“lemons”) have no incentive to mimic this²⁹⁵, because it would be way too costly. Consequently, pursuant to this view market participants can sort high quality from low quality firms by looking at the level of debt in each firm’s capital structure²⁹⁶.

²⁹³ Harris & Raviv, *supra* note 221, 311

²⁹⁴ Jeremy Stein, *Convertible Bonds as Backdoor Equity Financing*, 32 JOURNAL OF FINANCIAL ECONOMICS 3, 7

²⁹⁵ Linda Klein et al., *Debt vs. Equity and Asymmetric Information: A Review*, 37 FINANCIAL REVIEW 317, 320

²⁹⁶ According to this theory of capital structure issuing debt will reduce the cost of capital of the issuing firm, since market participants tend to discount less in pricing debt securities for they expect the venture not to be so overvalued. To the contrary, equity is perceived as a sign of overvaluation of the venture and thus investors tend to apply a higher discount in pricing stock; *see* Myers & Majluf, *supra* note 59, 187

Apparently convertible preferred stock cannot fulfill this function, because its issuance does not give rise to the risk of a bankruptcy penalty. Although it is definitely a debtlike financial instrument, a default on the payment of a preferred dividend does not trigger an event of default that can force the issuer into bankruptcy. This is a major difference between this hybrid security and paradigm debt. Therefore, this model has no value in the VC context, as long as VCs have convertible preferred as their investment vehicle.

According to the second of the two approaches, when a firm chooses to obtain external finance through debt rather than equity, it means that its management retains a higher proportion of ownership in the firm²⁹⁷. If the firm were of low quality, then the insiders wouldn't choose to act in this way, because a larger equity stake would be costly to a risk-averse manager. Contrarily, a manager who is confident about its firm's potential chooses to keep a larger portion of equity because she considers it as less risky and thus less costly, given the profit profile of her firm. Thus, higher levels of debt give a positive credible signal to capital suppliers, who can use this reasoning to sort out good firms from bad firms.

ii. Reversing the signaling game; Sorting out entrepreneurs by using convertible preferred stock

By relying on the axioms of the second of the two leverage signaling theories of capital structure, VCs have the potential of developing a screening mechanism complementary to the one of staged investment that we examined in Part II. However, in order to accomplish this function the signaling game that was described above must be

²⁹⁷ Leland & Pyle, *supra* note 65, 372

reversed and be transformed into a screening strategy. This is because in the VC financing setting the entrepreneur (the informed party of the game) does not have the bargaining power to move first and choose its capital structure on her own, when she is approaching the VC to ask for financing²⁹⁸. Therefore, the entrepreneur is not able to *signal* –in the game theoretic sense- to the VC by loading its capital structure with more debt than equity. Thus, the informed agent cannot move first and thereupon the model cannot work in exactly the same way, as it was described above.

Nonetheless, the VC can still take advantage of the signal that debt conveys so as to structure the following screening game: given that the VC has the bargaining power to move first and to dictate its preferred terms in the financial contract²⁹⁹, it can offer to the informed start-up firms a menu of incentive compatible choices (contracts), from which they will self-select revealing their private information through their choice³⁰⁰. Those that will choose the contract that will load their capital structure with convertible preferred stock, which will necessarily leave more space to the managers to take an equity stake in the company, will reveal their confidence in the potential of their venture. In essence, convertible preferred does here what debt does according to the second of the two models: it screens good firms from bad firms by letting their management show how much confidence they have in their firm.

²⁹⁸ The bargaining power of the VC can be “significant, but not decisive”, see Bratton, *supra* 152, 920

²⁹⁹ As Steven Kaplan asserts “if you don't write the contracts a certain way, the VCs won't give you any money...”; *Bargaining Power: Effective Venture Capital Contracts Come in Many Forms*, CAPITAL IDEAS (May 2004) [summary of the research conducted by Steven Kaplan & Per Strömberg, *supra* note 100, published at <http://www.chicagogsb.edu/capideas/may04/contracts.html>]

³⁰⁰ RASMUSEN, *supra* note 53, 267

C. Financial Contracting Theory and its Application in VC Financings: Governance Features of Convertible Preferred Stock II

The foregoing analysis makes evident that the VCs have developed a sophisticated financing process³⁰¹, which successfully addresses two major challenges of contracting: moral hazard and adverse selection. However, going back to Part I and the mapping of the impasses of contracts, we see that there is one more contractual problem that VCs have to deal with: the *stricto sensu* incompleteness of contracts; the fact that the parties to a contract cannot possibly specify fully all future contingencies that will affect their relationship. In this section I am going to scrutinize how VCs struggle against the problem created by these unspecified future eventualities and what marks does this struggle leave on the corporate governance structure of the VC-backed firm.

1. Advanced Security Design: Separating Cash Flow and Control Rights

It has been stated in the financial contracting literature that incentive problems alone cannot help shape a satisfactory theory of capital structure³⁰². Therefore, authors that belong to this stream of thought have introduced an additional consideration in the financial structure design process: the allocation of decision or control rights. This theory postulates that cash flow rights and control rights should not be necessarily viewed as two sides of the same coin, but they should be thought of as independent instruments that can well be separated³⁰³.

³⁰¹ Klaus Schmidt, *Convertible Securities and Venture Capital Finance*, 58 JOURNAL OF FINANCE 1139, 1139

³⁰² Hart, *Financial Contracting*, 1083

³⁰³ *Id.* at 1089

Indeed, one of the key issues in designing securities in the framework of the VC contracting process is separately allocating cash flow and control rights between the investors and the entrepreneur³⁰⁴³⁰⁵. In fact, one of the reasons why VCs choose convertible preferred in order to invest in the entrepreneurial firm is because it allows them greater flexibility to obtain that separation³⁰⁶. In regard to this aspect, the VC financing process seems to be taking under account this first axiom of financial contracting theory.

In general, separation of cash flow from control allows corporate planners first to create income streams that incentivize the managers to exert optimal effort (*see* III.B) and then, independently from the financial structure that is established by these return patterns, to provide a certain class of investors with control over the firm's decision mechanisms. If we were to provide a simple definition of the separation of cash flow and control we would state that it is the process, by which the right to the residual income from an asset is detached from the residual right to control the fate of this asset³⁰⁷. This again turns to the idea that was discussed above (III.B.2) that securities need not to be determined exogenously and taken with the rights that are customarily attached to them

³⁰⁴ Andreas Bascha & Uwe Walz, *Financing Practices in the German Venture Capital Industry: An Empirical Assessment*, Working Paper No. 2002/08 Center For Financial Studies, Frankfurt, 6 available at <http://www.altassets.com/pdfs/financing-practices18-9-02.pdf>; Kaplan & Strömberg, *supra* note 100, 295, 313

³⁰⁵ For the range of mechanisms available to (public) firms to separate cash flow from control *see* in general Lucian Bebchuk, Reinier Kraakman & George Triantis, *Stock Pyramids, Cross-Ownership and Dual Class Equity: The Mechanisms and Agency Costs of Separating Control From Cash-Flow Rights* in CONCENTRATED CORPORATE OWNERSHIP (R. MOCK ed., 1999) 445

³⁰⁶ Thomas Hellmann, *The Allocation of Control Rights in Venture Capital Contracts*, 29 RAND JOURNAL OF ECONOMICS 57, 62; Kaplan & Strömberg, *supra* note 100, 313; Schmidt, *supra* note 294, 1141; Paul Gompers, *Ownership and Control in Entrepreneurial Firms: An Examination of Convertible Securities in Venture Capital Investments*, unpublished manuscript (on file with Harvard Business School Library), 1

³⁰⁷ *See* HART, *supra* note 14, 63-64

under their paradigm form, but can be developed and engineered endogenously so that they can help the issuer or the investor achieve its strategic and financial goals.

By using covenants in the financing contract VCs allow themselves without being the residual claimants of the firm to have significant control over a certain number of board seats, voting power on an as-converted basis, veto rights over major corporate transactions and even the right to replace the CEO³⁰⁸ (which can actually be the result of having majority of the voting power or of the board seats). Thus, an idiosyncratic quasi-dual class structure is established within the start-up firm. This allocation of control rights affects the corporate governance structure of the firm in a much more direct way than the allocation of cash flow rights. While the design patterns of the latter simply affect the incentives of the members of the firm, the designation of the former instantly assigns the levers by which some of these members will decide the usages of the firm's underlying assets³⁰⁹. However, although in "custom-made" combinations the two types of rights may not go hand in hand like when securities are left intact with their exogenous characteristics, their allocation still remains largely interdependent in the sense that the *desideratum* when designing cash flow rights is to provide those who are assigned the control rights with optimal incentives to make the right decisions³¹⁰. Income streams and control rights are thus correlated even when they are separated, in the sense that the allocation of the former ensures the success in the allocation of the latter³¹¹.

³⁰⁸ Black & Gilson, *supra* note 28, 253

³⁰⁹ Triantis & Triantis, *supra* note 220, 1232; HART, *supra* note 14, 30

³¹⁰ Dewatripont & Tirole, *supra* note 261, 1028

³¹¹ See Jaime Zender, *Optimal Financial Instruments*, 46 JOURNAL OF FINANCE 1645

Picking the right persons within the firm to entrust them with the decision-making authority over the firm's actions is vital, for it determines whether the players respond efficiently to the contractual challenge of inherent *stricto sensu* incompleteness. Since certain actions and the circumstances under which they are taken are frequently noncontractible³¹², the best the parties to the corporate contract can do is at least specify who will have the decision-making authority over these eventualities; and they should make sure that the person who is assigned the authority has the optimal incentives at this point to maximize the firm's utility. Since all potential conflicts of interest between the manager and the suppliers of capital cannot be resolved through *ex ante* contracting³¹³, the firm's value partially depends and on the allocation of control rights³¹⁴.

In the following lines I will examine, which criteria financial contracting theory suggests that parties to a financial contract should use in order to obtain an optimal allocation of control rights and I will evaluate whether the control assignment patterns observed in VC investments follow these criteria.

2. Financial Contracting Theory and the State-Contingent Optimal Allocation of Control Rights

The framework of inquiry of the models articulated in financial contracting theory is the *stricto sensu* incompleteness of contracts. Many events, on the basis of which significant governance effects are going to be shaped, cannot be adequately specified in

³¹² Sujoy Mukerji, *Ambiguity Aversion and Incompleteness of Contractual Form*, 88 AMERICAN ECONOMIC REVIEW 1207, 1207

³¹³ Aghion & Bolton, *supra* note 39, 490

³¹⁴ See Hart, *Financial Contracting*

advance³¹⁵ and thus they will be necessarily omitted from the initial financing contract. Still parties can include in their contract a provision that will touch upon these noncontractible events and will transfer control either to the investor or the entrepreneur upon their occurrence. Thus, it follows that control rights will be necessarily contingent on the incidence of future variables. In line with this concept, financial contracting theory³¹⁶ has established a “contingent control model” on the optimal allocation of decision-making authority. In other words, according to the financial contracting literature the optimal balance of control between the manager and the investors is not flat, but state-contingent.

The model that has been cited the most for the purposes of analyzing the financial contract between the VC and the entrepreneur is the one of Aghion and Bolton³¹⁷. The reason that Aghion’s and Bolton’s model is chosen as the center of analysis in the VC literature is that it assumes a single entrepreneur, a single investor and a single project; assumptions that are very close to the reality of VC investments. The starting point of the model is that the entrepreneur derives both pecuniary (: cash flows) and non-pecuniary benefits (: private benefits of control) from the project, while the investor can only benefit from the project’s cash flows. The two have different utility functions and thus there will be unavoidably conflicts of interest during the course of their relationship. But, if control rights are allocated properly between the two, then at least the impact of these conflicts of interest on the total value of the firm can be minimized³¹⁸. Consequently,

³¹⁵ Bratton, *supra* note 152, 902

³¹⁶ See Hart, *Financial Contracting*

³¹⁷ Aghion & Bolton, *supra* note 39

³¹⁸ Hart, *Financial Contracting*, 1085-1086

given the assumptions that the allocation of decision rights should be state-contingent and that this allocation will determine the impact that conflicts of interest have on the success of the project, the question posed by financial contracting theory can be formulated as follows: in what states of the world it will be optimal to give the control rights to the entrepreneur and in what states of the world it is the investor that should be vested with decision-making authority?

To answer this question a corporate planner should realize which states of the world create suboptimal incentives for either the entrepreneur or the outside investor. At the point, where a certain state of the world, a certain financial condition, creates the incentive for the entrepreneur-manager to underinvest or to increase the riskiness of the project, control should be transferred to the outside investor³¹⁹. Thereupon, in the initial contract verifiable indicia should be ascertained that will signal that the incentive to invest inefficiently is present in the entrepreneur and that at this point a transfer of control should occur.

One of the ways to realize when the entrepreneur will have the tendency for suboptimal decision-making is to look at the kind of income stream that is attached to the instrument she holds. In the case of VC-backed firms this instrument is almost always common stock; the entrepreneur is usually an equityholder. Equityholder control is generally optimal in good states of the world, when the firm is solvent and not financially constrained³²⁰. This is because under these circumstances equityholders truly are the residual claimants of the firm and thus have an incentive to maximize cash inflows. It

³¹⁹ Zender, *supra* note 218, 1646

³²⁰ Aghion & Bolton, *supra* note 39, 490; Dewatripont & Tirole, *supra* note 261, 1028; Triantis & Triantis, *supra* note 220, 1252

follows then, that when the financial performance of the VC firm is good, the control should stay with the entrepreneur. However, when the firm is entering the zone of insolvency and there is the threat that the cash flows it generates will not be sufficient so as to produce a dividend after the payments to creditors, then equityholders, if in control, will invest inefficiently by increasing the riskiness of the project (*see* III.B.4.i). At this point control should be transferred to debtholders because it is them that have now become the residual claimants³²¹. In VC-backed firms, where VCs claims are, as it was proved above (*see* III.B.4.ii), debtlike, it is to the VCs that decision-making authority should be transferred in bad states of the world.

Based on this observations the contingent control model of Aghion and Bolton suggests that when an entrepreneurial firm is not financially constrained, control should remain with the entrepreneur-common stockholder, while during hard times it should be assigned to outside investors that hold debt or debtlike claims. Thus, if control rights were depicted as lying on a pendulum programmed to swing to pre-specified directions at pre-specified points in time, it should be programmed to swing towards the entrepreneur when the proxies for financial performance look good and to the outside investor when performance is measured as poor³²². Aghion and Bolton advocate that this particular kind of contingent control allocation can be obtained naturally with debt financing³²³ in the sense that the exogenously given allocation of control rights that paradigm debt establishes does lead to the above optimal distribution of decision-making authority.

³²¹ This is exactly the reason why the Delaware Chancery Court in *Credit Lyonnais Bank Nederland v. Pathe Communications Corp*, 1991 Del. Ch. LEXIS 215, at *109 n. 55 (Del. Ch. Dec. 30, 1991) stated that when the corporation is entering the zone of insolvency the directors also owe a fiduciary duty to creditors and not to the shareholders only.

³²² Yerramilli, *supra* note 178, 1

³²³ Aghion and Bolton, *supra* note 39, 490

Therefore, what remains to be examined is whether the covenants embedded in VC convertible preferred stock are designed in a way that achieves the kind of allocation of control rights that financial contracting theory claims is optimal for entrepreneurial firms. Does the pendulum of control rights swings to the direction of the VC in bad times and towards the entrepreneur in good times? Does convertible preferred stock proves not only to have the motivational properties of debt (*see* III.B), but also its (optimal) “control-allocational” attributes?

3. Optimal Programming of the Control Rights Pendulum in VC Contracts

As a general matter, the nature of the VC’s involvement in the start-up firm is widely acknowledged to be state-contingent³²⁴. The strategy of staged investment, which was analyzed in Part II is the foremost element of the contingency pattern. In addition to this, empirical data show that cash flow rights are also allocated on a state-contingent basis³²⁵. The general pattern is that when the performance of the VC-backed firm improves the entrepreneur captures a larger fraction of the total cash flows, while when the venture performs poorly then it is the VC that is entitled to a larger proportion of the total cash flows³²⁶. To illustrate this motive, it suffices to look at the layout of some cash

³²⁴ See e.g. Thomas Hellmann & Maju Puri, *Venture Capital and the Professionalization of Start-up Firms: Empirical Evidence*, 57 JOURNAL OF FINANCE 169, 185

³²⁵ Steven Kaplan & Per Strömberg, *Venture Capitalists as Principals: Contracting, Screening and Monitoring*, 91 AMERICAN ECONOMIC REVIEW 426, 427; Ola Bengtsson & Berk Sensoy, *Investor Abilities and Financial Contracting: Evidence from Venture Capital*, Working Paper (March 17, 2009), 2 available at SSRN <http://ssrn.com/abstract=1240844>

³²⁶ Kaplan & Strömberg, *supra* note 100, 295; Kaplan & Strömberg, *supra* note 325, 427; Black & Gilson, *supra* note 28, 253; Bengtsson & Sensoy, *supra* note 194, 1

flow rights, such as the convertibility option, the anti-dilution protection, the redemption right³²⁷ and the dividend and liquidation preference.

Starting with the convertibility option, if the start-up firm turns out to perform well, then the VC may want to convert its preferred stock into equity and thus be entitled to a portion of the upside³²⁸. To be sure, in most VC contracts when a firm's good performance results in an IPO or an acquisition at a high price, then the conversion of the convertible preferred into common is mandatory, it occurs automatically. The result of the conversion is that now the entrepreneur does not have to wait for the VC to be paid its dividend or liquidation preference before she can receive anything from the distribution, but instead stands in the same place with the VC in terms of sharing in the firm's cash flows; thus, after the conversion the entrepreneur is able to capture a larger proportion of the total cash flows than she did before.

As far as the redemption right is concerned, if the portfolio company performs poorly and no liquidity event takes place within a period of time specified in the contract, then the VC can put the stock back to the firm and cash out its investment. On the contrary, if the venture performs well and consummates an IPO or a profitable trade sale within the same amount of time, then the VC is not entitled to exercise the put option.

Turning to the application of anti-dilution provisions, their protection is triggered after follow-on financing rounds take place. If the start-up firm does not perform well,

³²⁷ It should be mentioned that CUMMING & JOHAN, *supra* note 263 at 421 classify the redemption right as a control right. Although, there might be a "quiet" control feature in the put right that VCs customarily have, I follow here the Kaplan & Strömberg, *supra* note 100 at 288 definition of control rights as including only voting, board and veto rights.

³²⁸ Georg Gebhardt & Klaus Schmidt, *Conditional Allocation of Control Rights in Venture Capital Firms*, CEPR Discussion Paper No. 5758, 1 available at [http://epub.ub.uni-muenchen.de/909/1/Gebhardt-Schmidt\(2006M\).pdf](http://epub.ub.uni-muenchen.de/909/1/Gebhardt-Schmidt(2006M).pdf)

then the follow-on financing will take place at a lower valuation. The anti-dilution protection will in this case allow the VC to get more shares, thus making sure that in this bad state of the world the cash flows, to which it is entitled are not reduced.

Finally, as far as the foremost characteristic of convertible preferred is concerned, the dividend and liquidation preference, the same contingency pattern applies. When the firm performs poorly, then its total cash flows are going to be small and thus the preference is going to allow the VC to capture a higher fraction of the (small) total sum. As the firm's performance improves, then more is left for the common shareholder-entrepreneur to benefit from³²⁹.

Apart from the cash flow rights that are allocated on a state-contingent basis, empirical data show that control rights as well are not held at all times by either the VC or the entrepreneur, but there is rather "a continuous variable that is adjusted and fine-tuned through a multitude of contingent provisions"³³⁰ that makes the possession of this type of rights conditional upon the occurrence of observable measures of firm performance³³¹. However, according to the axioms of financial contracting theory mere state-contingency of the control rights is not sufficient for the company to optimally respond to the challenge of the *stricto sensu* incompleteness of contracts. Additionally, the pendulum of control rights should be programmed in such a way, so that more governance intervention is allowed to the VC when performance is poor and more to the entrepreneur when performance is good. Only this scheme will ensure that control will

³²⁹ Bengtsson & Sensoy, *supra* note 194, 12

³³⁰ Andrei Kirilenko, *Valuation and Control in Venture Finance*, 56 JOURNAL OF FINANCE 565, 565

³³¹ PATRICK BOLTON & MATHIAS DEWATRIPONT, CONTRACT THEORY (2005), 524

stand each time with the person that has the optimal incentives of maximizing the value of the venture.

One of the determinants of the programming of such a pendulum in firms is expected to be the level and the direction of informational asymmetries at the time the contract is drafted³³². Given the extreme uncertainties that exist in start-up investments and the concomitant severity of agency problems, the VC will naturally want to get control in more states of the world³³³, at least until more (and positive) information about the prospects of the venture are revealed. As a general matter, this desire of the VCs tends to result in an unusual corporate governance structure of the VC-backed firm, where preferred rather than common shareholders control the board³³⁴ for the greatest part of the firm's pre-IPO life³³⁵.

Nonetheless, in Kaplan's and Strömberg's empirical study there is indeed evidence of accounting and performance indicia that are utilized in the drafting of covenants, pursuant to which control shifts gradually towards the entrepreneur as performance improves³³⁶.

First of all, this control-shifting pattern is evident in the typical provisions governing the conversion feature of the VC preferred stock. As it was noted above, when

³³² Wouter Dessein, *Information and Control in Alliances and Ventures*, 60 JOURNAL OF FINANCE 2513, 2513

³³³ *Id.*; Black & Gilson, *supra* note 28, 253

³³⁴ Fried & Ganor, *supra* note 168, 970

³³⁵ Due to this idiosyncratic corporate governance structure in VC-backed firms it has been postulated that the entrepreneurs are subject to an increased risk of expropriation by the VCs, *see* Atanasov et al., *supra* note 159. Although it is contestable whether the data used in the aforementioned paper do indeed function as reliable proxies for the existence of an actual risk of expropriation, it is plausible that the status of the common shareholders in VC-backed firms is sufficiently vulnerable, so as to generate its own agency costs; Fried & Ganor, *supra* note 168, 970.

³³⁶ Kaplan & Strömberg, *supra* note 100, 294; Kaplan & Strömberg, *supra* note 325, 427; Bratton, *supra* note 152, 917

performance improves the VC may opt to convert its preferred into common stock or if a major liquidity event takes place the preferred converts automatically. The conversion has implications for the VC's cash flow rights, but it also has an impact on the scope of the VC's control rights, since there are clauses in the charter that state that the increased control rights, such as disproportionate share of votes, reserved board seats and veto powers, that the VC used to have are lost upon conversion³³⁷. The pendulum of control rights is thus programmed to swing towards the entrepreneur in case the firm is performing so good that the convertibility option is exercised. Therefore, in regard to this aspect the governance of the VC firm purports to be in alignment with the basic axioms of financial contracting theory.

Kaplan's & Strömberg's survey reports a series of other provisions found in VC contracts that espouse the proposition of financial contracting theory: the VC may vote for all of its preferred shares on an as-converted basis only if the venture's EBIT (earnings before interest and taxes) are below a certain threshold; if net worth of the firm is below a certain threshold then the VC will get three more board seats; if the firm fails to pay out a certain fraction of its revenues as dividend, then the VC gets to elect the majority of the board etc.³³⁸.

But the most illustrative and archetypal contingent-control provision that embraces the principles of financial contracting theory is the fact that in a VC-backed firm control shifts entirely to the entrepreneur upon the IPO. Black & Gilson in a seminal

³³⁷ Gebhardt & Schmidt, *supra* note 328, 1-2

³³⁸ Kaplan & Strömberg, *supra* note 100, 294-295

paper on the importance of securities markets for the success of a VC industry³³⁹ claim that a foundational element of VC investments rests not in one of the explicit provisions of the financial contract, but in an implicit contract between the VC and the entrepreneur that control will shift to the latter entirely upon a successful IPO³⁴⁰. This is feasible due to the dispersed ownership structure that US firms tend to have after they go public that essentially allows the managers to pull the strings in the firm's operations. To be sure, Black & Gilson claim that it is easier to infuse a VC contract with this implicit state-contingent control device, than it is with difficult and costly to negotiate explicit provisions that condition control shift on specified financial milestones³⁴¹.

All in all, empirical evidence shows that VC contracts are structured in a way that allows for control rights to be allocated in the way financial contracting theory deems optimal. This is a sign that VC-backed firms implement corporate governance structures that efficiently address the contractual challenge of *stricto sensu* incompleteness.

IV. The Mandatory Model of Corporate Law in Europe and its Implications for Venture Capital

A. Comparing the US and the European VC Industry

The past few years have seen a growing number of papers in the area of comparative corporate finance scholarship, which attempt to identify and shed light on the differences in VC financings around the world³⁴². As far as the comparison between

³³⁹ Black & Gilson, *supra* note 28

³⁴⁰ *Id.* at 245, 261ff.

³⁴¹ *Id.* at 263

³⁴² See e.g. Bascha & Walz, *supra* note 304; Cumming, *supra* note 155; Douglas Cumming, *United States Venture Capital Financial Contracting: Evidence from Investments in Foreign Securities*, in *ADVANCES IN*

the US and the European VC industry is concerned³⁴³, authors in the overwhelming majority of papers tend to focus on two remarkable disparities: (i) the non-prevalence of convertible preferred stock in European VC financings³⁴⁴; and (ii) the considerably lower rates of return on VC investments in Europe, when compared to the US³⁴⁵. As an American commentator puts it “venture capital is the one technique our competitors in other industrial countries have yet to master”³⁴⁶. Several ideas have been put on the table to explain this divergence and they implicate historical, institutional, political, legal and cultural³⁴⁷ considerations. Elements of truth are found in all arguments and it is thus most likely a combination of factors that has led to the observed gap between Europe and the US, as far as the size, performance and transactional practice of the VC industry is concerned.

FINANCIAL ECONOMICS, vol. 12 (M. HIRSCHHEY ed.) (2007), 405ff; Douglas Cumming et al., *Legality and Venture Governance around the World*, JOURNAL OF BUSINESS VENTURING (forthcoming), available at http://www.cfainstitute.cn/foundation/pdf/2006em_cumming.pdf ; Douglas Cumming et al., *Legality and Venture Capital Exits*, 12 JOURNAL OF CORPORATE FINANCE 214; Brouwer & Hendrix, *supra* note 266; Hege et al., *supra* note 155; Lerner & Schoar, *supra* note 155; Marco Da Rin et al., *The Law and Finance of Venture Capital Financing in Europe: Findings from the Ricafé Research Project*, 7 EUROPEAN BUSINESS ORGANIZATION LAW REVIEW 525; Schwienbacher, *supra* note 239; Kuntara Pukthuanthong et al., *Why Venture Capital Markets are Well Developed in Some Countries but Comparatively Small in Others: Evidence from Europe*, in VENTURE CAPITAL IN EUROPE (G. GREGORIOU ET AL. eds.) (2007), 33ff.; Steven Kaplan et al., *How Do Legal Differences and Learning Affect Financial Contracts?*, Working Paper (June 2004) available at SSRN <http://ssrn.com/abstract=557007> ; John Armour & Douglas Cumming, *The Legislative Road to Silicon Valley*, 58 OXFORD ECONOMIC PAPERS 596; Leslie Jeng & Phillippe Wells, *The Determinants of Venture Capital Funding: Evidence across Countries*, 6 JOURNAL OF CORPORATE FINANCE 241

³⁴³ For a comparison between the US and the Japanese VC markets see Curtis Milhaupt, *The Market for Innovation in the United States and Japan: Venture Capital and the Comparative Corporate Governance Debate*, 91 NORTHWESTERN UNIVERSITY LAW REVIEW 865, 874ff.

³⁴⁴ See e.g. Kaplan et al., *supra* note 342, 2

³⁴⁵ See e.g. Hege et al., *supra* note 155, 1

³⁴⁶ JOSEPH BARTLETT, VENTURE CAPITAL: LAW, BUSINESS STRATEGIES, AND INVESTMENT PLANNING (1988), 12

³⁴⁷ See Allan Williams et al., *International Labour Mobility and Uneven Regional Development in Europe: Human Capital, Knowledge and Entrepreneurship*, 11 EUROPEAN URBAN AND REGIONAL STUDIES 27

First of all, it takes some time for institutions of financial intermediation to develop³⁴⁸ and therefore it seems plausible to assert that the VC industry in the US had more time to mature, since it essentially appeared after World War II, while the spread of VC to Europe didn't occur until the early 80s³⁴⁹. To be more precise, with time comes learning about optimal or effective contracts³⁵⁰ and therefore the US VCs were able to experiment by spreading learning costs over time and gradually fine-tune a sophisticated financing process that optimally tackles the challenges of contracting³⁵¹. This might help explain the first point of divergence, namely that European VCs tend not to use so often the financially optimal security of convertible preferred stock but instead use the less complex instrument of common equity³⁵².

In addition to this, Europe lags behind in terms of size of securities markets, which are deemed essential for the development of a robust VC industry. Active stock exchanges not only provide the VC with the profitable exit strategy of the IPO, but they also incentivize the entrepreneur, who aspires to regain control, if the firm goes public³⁵³. Furthermore, deep securities markets allow the institutional investors that choose to invest in VC funds to hedge against the high risk of failure that VC investments usually have. Despite the establishment of the “Euro Neuer Markt” (EURO.NM), a cross-border

³⁴⁸ See Peter Temin, *Financial Intermediation in the Early Roman Empire*, 64 JOURNAL OF ECONOMIC HISTORY 705, 713ff.

³⁴⁹ Garry Bruton et al., *Institutional Influences on the Worldwide Expansion of Venture Capital*, 29 ENTREPRENEURSHIP THEORY AND PRACTICE 737, 739-740

³⁵⁰ Kaplan et al., *supra* 342, 25

³⁵¹ John Armour, *Law, Innovation and Finance*, in VENTURE CAPITAL CONTRACTING, *supra* note 84, 137

³⁵² Kaplan et al., *supra* note 342, 2

³⁵³ See Black & Gilson, *supra* note 28

stock exchange that specializes in listing small companies and start-up firms³⁵⁴, Europe as a general matter, relying more on a bank-oriented financial system, is unable to compete with the deep securities markets that form the backbone of the American economy. This results in a lower median excess return on VC investments in Europe³⁵⁵. Given the importance of VC for technological innovation and economic development³⁵⁶, this underperformance of the European VC industry has led to initiatives, such as the EU Commission's Risk Capital Action Plan and the EU-sponsored research project of RICAFE ("Risk Capital and the Financing of European Innovative Firms")³⁵⁷, which attempt to identify the weaknesses of VC financing in Europe and to provide a roadmap for overcoming them.

Moreover, as it was mentioned earlier in the paper (III.B.3), the non-prevalence of the use of convertible preferred stock in European VC investments is partially attributed to the fact that tax rules do not subsidize its use, as is the case in the US³⁵⁸. To stimulate VC financing, some European countries have provided tax incentives for investors that hold participations in VC partnerships³⁵⁹ or have their funds invested in VC trusts³⁶⁰, but apparently this type of incentives does not subsidize specifically the use of convertible

³⁵⁴ Jeffrey Neuchterlein, *International Venture Capital: The Role for Start-up Financing in the United States, Europe and Asia*, in ECONOMIC STRATEGY AND NATIONAL SECURITY: A NEXT GENERATION APPROACH (P. DESOUZA ed., 2000) 276

³⁵⁵ See Hege et al., *supra* note 155

³⁵⁶ WILLIAM BYGRAVE & JEFFRY TIMMONS, VENTURE CAPITAL AT THE CROSSROADS (1992), 228

³⁵⁷ See Da Rin et al., *supra* note 342

³⁵⁸ See Gilson & Schizer, *supra* note 238

³⁵⁹ For tax incentives specifically targeted at VC in Austria see Wolf Temmel, *Austria*, in GLOBAL VENTURE CAPITAL TRANSACTIONS (B. BRECHBÜHL & B. WOODE eds., 2004), 51

³⁶⁰ For tax incentives specifically targeted at investing in VC trusts in the UK see Armour, *supra* note 351, 145

preferred stock, which is a financially optimal instrument for start-ups and thereupon could help European VC investments to have a higher rate of return.

Finally, a small number of papers seek to evaluate the impact of legal factors – other than tax- on the development of a robust VC industry in a country. Some of these papers are simply an extension of the literature on the relationship between a country's legal origin and its financial development³⁶¹ and have as a reference point the seminal paper of La Porta, Lopez-de-Silanes, Shleifer and Vishny on law and finance³⁶². Other scholarly contributions examine the impact of bankruptcy law on the European VC transactional practice³⁶³, while only a very small portion attempts to identify a link between a country's corporate law and VC performance³⁶⁴.

In the following sections by relying on the valuable inferences that were drawn within the scope of Parts I to III, I seek to explain the impact of the mandatory nature of European corporate law on VC transactional practice. With this analysis I aspire to add another layer of ideas to the aforementioned small part of the corporate finance literature that views a country's corporate law as a determinant of the VC industry's performance.

³⁶¹ Cumming et al., *Legality and Venture Governance around the World*, *supra* note 342; Pukthuanhong et al., *supra* note 342. Some of the legal factors (quality of law and minority shareholder protection) that are examined by Kaplan et al., *supra* note 341 are also taken by the traditional literature on legal origins and financial development, although the paper cannot be classified as a mere extension of this literature.

³⁶² Rafael La Porta et al., *Law and Finance*, 106 JOURNAL OF POLITICAL ECONOMY 1113

³⁶³ Kaplan et al., *supra* note 342, 12; Armour, *supra* note 351, 152ff.

³⁶⁴ Armour, *supra* note 351, 148ff.; ERIK VERMEULEN, THE EVOLUTION OF LEGAL BUSINESS FORMS IN EUROPE AND THE UNITED STATES: VENTURE CAPITAL, JOINT VENTURE AND PARTNERSHIP STRUCTURES (2003), 277ff.

B. The Enabling Character of US Corporate Law versus the Mandatory Nature of European Corporate Law

In a comparative corporate law discourse that would focus on public corporations a reference to the old debate on the contrast between enabling and mandatory corporate law would be of little significance. This is because currently in most developed jurisdictions -and certainly in the US and in the EU- public companies are to a large extent subject to mandatory rules; rules promulgated either by a central regulator, like the US federal securities laws³⁶⁵, or by self-regulatory organizations³⁶⁶, namely by the various stock exchanges, where companies voluntarily choose to list their securities, but once they make this step they are subject to standards of mandatory nature³⁶⁷. In addition to this, as far as public companies are concerned, transatlantic cross-listings function as a vehicle of convergence not only of the general character of corporate law, but also of its substantive content³⁶⁸. However, in the framework of a discussion that focuses on venture capital, where one is concerned with the legal regime of small private companies, the comparison between enabling and mandatory corporate law seems to be still critical.

US corporate laws, and in particular Delaware corporate law, reflect a facilitative rather than regulatory treatment of corporations made up largely of optional, default rules, which corporate constituencies may contract around in order to obtain a private ordering of their affairs³⁶⁹. On the contrary, most European jurisdictions, especially those

³⁶⁵ Troy Paredes, *A Systems Approach to Corporate Governance Reform: Why Importing U.S. Corporate Law isn't the Answer*, 45 WILLIAM & MARY LAW REVIEW 1055, 1099

³⁶⁶ HOWELL JACKSON & EDWARD SYMONS, REGULATION OF FINANCIAL INSTITUTIONS (1999), 751

³⁶⁷ Paredes, *supra* note 365, 1101

³⁶⁸ Amir Licht, *Cross-Listing and Corporate Governance: Bonding or Avoiding?*, 4 CHICAGO JOURNAL OF INTERNATIONAL LAW 141, 142

³⁶⁹ Richard Buxbaum, *Facilitative and Mandatory Rules in the Corporation Law(s) of the United States*, 50 THE AMERICAN JOURNAL OF COMPARATIVE LAW 249, 249; Norman Veasy, *Should Corporation Law*

of continental Europe, have cemented a rigid and mandatory structure of corporate law that fixes key features of corporate governance and corporate finance without having enough play in the joints³⁷⁰. Consequently, it comes as no surprise that when authors choose to depict the various national corporate laws on a flexibility/rigidity continuum³⁷¹, Delaware law is on the one extreme while most European jurisdictions on the other³⁷².

There are historically many reasons why such a different path was followed on the two sides of the Atlantic, but their comprehensive analysis here would fall outside the scope of the chapter³⁷³. Perhaps it suffices to point to the emergence of a jurisdictional competition among the US states in the beginning of the 20th century that had them competing to attract firms by enacting corporation codes with a minimum of restrictive provisions³⁷⁴. At the same time European legislators answered to the “founders’ boom” following the liberalization of entry requirements for companies with a backlash that established mandatory provisions for the organization of the internal affairs of a limited liability company³⁷⁵.

Inform Aspirations of Good Corporate Governance Practices – or Vice Versa? 149 UNIVERSITY OF PENNSYLVANIA LAW REVIEW 2179, 2179

³⁷⁰ See Katharina Pistor et al., *The Evolution of Corporate Law: A Cross-Country Comparison*, 23 UNIVERSITY OF PENNSYLVANIA JOURNAL OF INTERNATIONAL ECONOMIC LAW 791

³⁷¹ *Id.* at 826

³⁷² See John Coffee, *The Mandatory/Enabling Balance in Corporate Law: An Essay on the Judicial Role*, 89 COLUMBIA LAW REVIEW 1618 and Jeffrey Gordon, *The Mandatory Structure of Corporate Law*, 89 COLUMBIA LAW REVIEW 1549

³⁷³ For an analysis of the historical reasons that led to the establishment of the enabling approach to corporate law in the US see Buxbaum, *supra* note 367, 250-251; For an overview of the development of German corporate law, including references to the laws of other European jurisdictions see Hanno Merkt, *Zur Entwicklung des Deutschen Börsenrechts von den Anfängen bis zum Zweiten Finanzmarktförderungsgesetz*, in *EINE ÖKONOMISCHE, RECHTSVERGLEICHENDE UND RECHTSPOLITISCHE UNTERSUCHUNG* (K.HOPT & B. RUDOLPH eds.) (1997), 15

³⁷⁴ For the history of the regulatory competition in the US in the field of corporate law see William Carry, *Federalism and Corporate Law: Reflections upon Delaware*, 83 YALE LAW JOURNAL 663, 663-668

³⁷⁵ Pistor, *supra* note 370, 811

As a general matter, the optional or mandatory character of corporate law in a jurisdiction influences mainly the allocation of control rights among corporate constituencies³⁷⁶. The internal distribution of decision-making authority differs significantly in companies that function under a mandatory regime of corporate law, compared to firms that are governed by a set of suppletive rules³⁷⁷; the allocation of control rights cannot be changed by private agents where law is mandatory, whereas where rules are optional it can be contractually adjusted. In Europe there is a clear and fixed division of powers between the shareholders and the directors, while in Delaware this issue is left largely to the charter of each firm³⁷⁸. However, should the promoters of a Delaware firm choose to avoid the bargaining costs associated with tailoring a *suis generis* charter, they can follow the default rule that grants an extensive authority to the board with regard to the affairs of the corporation³⁷⁹.

Apart from control rights, the nature of corporate law also has an impact on several issues pertaining to corporate finance. In the great majority of European jurisdictions there are stringent rules that require a minimum capital or minimum par value of shares³⁸⁰, restrict authorized unissued capital³⁸¹, establish preemptive rights for the shareholders³⁸² or restrict the right of the company to repurchase its own shares³⁸³. In

³⁷⁶ *Id.* at 797

³⁷⁷ Alain François & Jeroen Delvoie, *De Wet Corporate Governance in het Licht van het Ruimere Corporate Governance Debat*, in *DE WET CORPORATE GOVERNANCE ONT(K)LEED* (K. BYTTEBIER, ed.) (2004) 29

³⁷⁸ Pistor, *supra* note 370, 818

³⁷⁹ DGCL § 141(a)

³⁸⁰ See Luca Enriques & Jonathan Macey, *Creditors versus Capital Formation: The Case against the European Legal Capital Rules*, 86 CORNELL LAW REVIEW 1165

³⁸¹ Katharina Pistor et al., *Innovation in Corporate Law*, 31 JOURNAL OF COMPARATIVE ECONOMICS 676, 682

³⁸² Markus Berndt, *Global Differences in Corporate Governance Systems*, in *ÖKONOMISCHE ANALYSE DES RECHTS* (P. BEHRENS ET AL., eds.) (2002), 17-18

Delaware all of these issues are left either to the charter or to the discretion of the directors with minimal interference from statutory law. It is also worth mentioning that in Europe shareholders can make distributions to themselves in the form of dividend payments, while one of the hallmark features of Delaware corporate law is that management can withhold such payments³⁸⁴.

C. Does the Mandatory Nature of European Corporate Laws Directly Impede VC Contracting?

As it became evident in Parts II and III, successfully structuring VC transactions requires a great deal of contracting flexibility. Parties need to be able to separate cash flow from control rights, allocate the latter on a state-contingent basis, design securities in a way that incentivizes the entrepreneur and that provides the VC with downside protection. Therefore, they obviously need rules that would provide them with the opportunity to privately order their transaction and to fashion the governance structure of the start-up firm in a way that will increase the odds for success. Based on this reasoning several authors have argued that the mandatory character of corporate law in Europe compromises the contracting flexibility required for VC financings³⁸⁵. At first sight this argument seems plausible; there must be some rules in European corporate statutes that prohibit VCs from structuring the transactions, in the way they would want. But, is this really the case? Is there anything special in European corporate laws that proscribes the attachment of the standard cash flow and control rights to the security that VCs hold? In

³⁸³ Nidal Rashid Sabri, *Using Treasure "Repurchase" Shares to Stabilize Stock Markets*, 8 INTERNATIONAL JOURNAL OF BUSINESS 426, 437-438

³⁸⁴ Enriques & Macey, *supra* note 380, 1169

³⁸⁵ Paredes, *supra* note 365, 1148; VERMEULEN, *supra* note 364, 286-287; Armour, *supra* note 351, 149-150

other words, is it illegitimate for a VC to fully or partially replicate the characteristics of US-style VC convertible preferred stock in European jurisdictions?

Empirical data³⁸⁶ and surveys of national corporate laws on the characteristics, which are pertinent to VC transactions³⁸⁷, show that all the features of US-style VC convertible preferred stock, with the exception of full-blown redemption rights³⁸⁸, are indeed *fully* available by statute to European VCs. To be sure, convertible preferred stock is used in 53.8% of VC financings in countries of French legal origin and in 48.8% of VC financings in countries of German legal origin. Anti-dilution protections are found in 73.9% of the contracts in countries of French legal origin and in 50.0% of the contracts in countries of German legal origin. Liquidation preferences for more than the invested funds are present in 66.7% of the French legal origin VC financings and in 43.9% of the German, while state-contingent board control is found in 42.3% of French origin contracts and in 65.1% of the German origin contracts³⁸⁹. Due to capital maintenance rules that are prominent in most European corporate statutes the percentage of

³⁸⁶ Kaplan et al., *supra* note 342, 31

³⁸⁷ Temmel & Wolf, *supra* note 359, 36-41, 49-50; Steven De Schrijver, *Belgium*, in GLOBAL VENTURE CAPITAL TRANSACTIONS, *supra* note 359, 58-66, 78-80; Mika Alanko & Jon Unnérus, *Finland*, in GLOBAL VENTURE CAPITAL TRANSACTIONS, *supra* note 359, 130-135, 143-144; Marcus Goedsche, *Germany*, in GLOBAL VENTURE CAPITAL TRANSACTIONS, *supra* note 359, 153-157, 167-169; Luca Tiberi, *Italy*, in GLOBAL VENTURE CAPITAL TRANSACTIONS, *supra* note 359, 247-251, 257-258; Hugo Reumkens, *The Netherlands*, in GLOBAL VENTURE CAPITAL TRANSACTIONS, *supra* note 359, 266-272, 282-284; Erik Vermeulen, *Towards a New "Company" Structure for High-Tech Start-Ups in Europe*, 29, December 2000 available at SSRN <http://ssrn.com/abstract=255619>; Theodor Baums & Matthias Möller, *Venture Capital: U.S.-Modell und Deutsches Aktienrecht*, in CORPORATIONS, CAPITAL MARKETS AND BUSINESS IN THE LAW. LIBER AMICORUM RICHARD M. BUXBAUM (T. BAUMS ET AL., eds.) (2000), 33ff.

³⁸⁸ For restrictions in share buybacks and hence in redemption rights in the UK *see* EILIS FERRAN, COMPANY LAW AND CORPORATE FINANCE (1999), 430ff. and Armour, *supra* note 351, 150. For similar restrictions in the Netherlands *see* Vermeulen, *supra* note 387, 31-32. For similar restrictions in Germany *see* Baums & Möller, *supra* note 387, 44ff. For similar restrictions in Greece *see* Sabri, *supra* note 383, 438

³⁸⁹ Kaplan et al., *supra* note 342, 32. In countries of German legal origin the authors also include Korea, but this does not alter the big picture about VC financings in European countries with German legal origin.

redemption rights is low, but European VCs compensate with other senior exit mechanisms.

These data show that European corporate laws do not stand in the way of structuring a sophisticated VC financial contract and that it is both legitimate and feasible for a VC to replicate the features of the securities that US VCs use. Despite the fact that corporate statutes in Europe proscribe many other corporate finance transactions, thus compromising the contracting and financial flexibility of private European firms, there is no such effect with regard to VC transactions. European VCs may bargain for all the standard cash flow and control rights that US VCs successfully use without running the risk of having their contract repudiated by the court. In conclusion, the mandatory nature of many European corporate laws does not directly impede efficient VC contracting.

D. Contractual Path Dependence and Mandatory Corporate Law

Although European mandatory corporate laws do not specifically prevent US-style VC contractual structures from being transferred to most European jurisdictions, their general rigidity can be thought of as having an impact on the innovative capacity of European lawyers, who are those that are called to structure VC transactions³⁹⁰.

As a general matter, a mandatory legal regime is expected to lead lawyers and law firms to underinvest in contract innovation. When lawyers are not used to opt out of the rules of a corporate statute, because in the great majority of cases they are not allowed to do so, then it is expected that because of anchoring bias they will be reluctant to

³⁹⁰ For the role that lawyers play in differences among countries with regard to the VC industry *see* Armour, *supra* note 351, 139-141

expend effort and costs in transacting around the few optional rules that are left³⁹¹. Due to the fact that in Europe most of the rules are fixed, corporate law in general, including its few default rules, is viewed by legal practitioners as an “anchor”, as an established given reference point, adjustments to which are rare³⁹².

In other words, mandatory corporate law creates the problem of path dependence in commercial transactions; lawyers are locked in inefficient contractual structures and do not have the incentive to invest resources in acquiring innovative skills, which are necessary in order to structure efficient VC transactions. Instead, many of them preserve the status quo in VC financial contracts by using common equity³⁹³ and are hesitant to expend resources in learning Silicon-Valley contractual techniques by fear that the latter are either inapplicable in Europe or will be eventually repudiated by courts³⁹⁴. To be sure, even a cost-benefit analysis might deter lawyers and law firms from investing in learning financially advanced techniques, since the knowledge gained will only be used in a minority of transactions that do not yield enough fees in order to compensate lawyers for the time and resources expended in training. Thus, European lawyers may rationally anchor in the usage of traditional financing techniques that result in suboptimal corporate governance structures in VC-backed firms.

The argument that a mandatory system of corporate law creates anchoring bias and thus acts as a deterrent to contract innovation is consistent with the general premise

³⁹¹ About the concept of anchoring bias in behavioral psychology and decision theory see EUSTACE POULTON, *BEHAVIORAL DECISION THEORY: A NEW APPROACH* (1994), 187

³⁹² Marchel Kahan & Michael Klausner, *Path Dependence in Corporate Contracting: Increasing Returns, Herd Behavior and Cognitive Biases*, 74 WASHINGTON UNIVERSITY LAW QUARTERLY 347, 362

³⁹³ A status quo bias may also be present in this case; see *id.* At 360

³⁹⁴ In fact in the civil codes of many continental countries there are provisions that allow courts to invalidate contracts, where one party seems to be getting the “lion share”, as abusive.

that is found in the law and development literature that countries with a highly mandatory statutory law exhibit less *legal* innovation than countries with a more enabling law³⁹⁵. Legal innovation, namely the adjustment of a legal system to a dynamic environment, is a resultant not only of public lawmaking, but also of private lawmaking. That means that the general innovative capacity of a legal system does not depend only on the responsiveness of the legislator and the regulatory authorities to the changes in society, but also on the ability of lawyers to engage in creative legal engineering³⁹⁶.

Michael Powell has identified four different levels, at which lawyers contribute to lawmaking and legal innovation³⁹⁷. At the first and the second level, lawyers represent the private interests of their clients before legislative bodies and administrative agencies by being proactive and encouraging the authorities to enact laws that serve their clients' interests. An example of this type of private interests representation is when lawyers associated with activist investors in 2007 coordinated the pass of the North Dakota Publicly Traded Corporations Act, which would serve their client's goals³⁹⁸. Thus, at the first and the second level lawyers can indirectly contribute to the innovation of the public lawmaking.

At the third and the fourth level lawyers engage in the development of private law. At the third level, lawyers are able to help shape the case law in certain field by presenting novel legal arguments to the court, whereas at the fourth level lawyers take

³⁹⁵ Pistor et al., *supra* note 381, 678; Pistor et al., *supra* note 370, 794; Vermeulen, *supra* note 387, 33-34

³⁹⁶ Doreen McBarney, *Law and Capital: The Role of Legal Form and Legal Actors*, 12 INTERNATIONAL JOURNAL OF THE SOCIOLOGY OF LAW 231, 233

³⁹⁷ Michael Powell, *Professional Innovation: Corporate Lawyers and Private Lawmaking*, 18 LAW & SOCIAL INQUIRY 423, 427

³⁹⁸ See Mark Roe, *The Shrinking Half-Life of Delaware's Corporate Tax Base*, Working Paper 2009 (on file with author)

advantage of gaps in the law and engineer original devices, such as tax shelters, takeover defenses and hybrid securities that create value for their clients. It is at this fourth level that lawyers need innovative capacity the most and it is thus expected that a mandatory corporate law regime that restricts corporate finance options and cements governance structures does not encourage lawyers to engage in this category of activities, even when there are “optional isles” within the law that would allow them to do so. Thus, under a strict legal regime the contribution of lawyers to private lawmaking is expected to stop at the third level.

In a professional culture where practitioners are used to engineer mere compliance and not innovative devices, lawyers are not expected to grab the opportunity and be creative, when the law occasionally allows it. Consequently, the rigidity of European corporate laws has indirectly compromised the innovative skills that lawyers need in the VC arena to adopt or create new techniques. This might be an additional reason of why the sophisticated and innovative instrument of convertible preferred stock is not used more often in Europe; this might be an additional reason of why Europe lags behind in the VC race.

V. Conclusion

In a private company setting corporate governance institutions can be viewed as responses to the contractual challenges of moral hazard, adverse selection and incompleteness of contracts. As a consequence the features of corporate governance mechanisms are structured in a way that allows the corporate constituencies to deal with

contractual design exigencies. Contract theory is thus a determinant of corporate governance.

VC-backed firms provide a representative example of this philosophy of design of corporate governance institutions. The financing practices that VC firms implement and the securities that they hold are carefully designed so as to allow the members of the firm to surmount the contractual obstacles. Staged investment (or staggered financing) is a screening mechanism that induces entrepreneurs to signal their intrinsic motivation to the VC firm and thus allows the latter to tackle the adverse selection problem. Convertible preferred stock, the VCs' investing vehicle of choice, allows the establishment of an incentive-compatible income stream, as it replicates the disciplining and agency cost-mitigating effects of paradigm debt while at the same time it eliminates the foremost agency cost of paradigm debt, the "asset substitution effect". Consequently, with the "debtlike" security of convertible preferred stock VCs can cope efficiently with the problem of moral hazard. In addition to this, the covenants embedded in convertible preferred stock help to generate an optimal state-contingent allocation of control rights that is in alignment with the basic axioms of financial contracting theory. Thereupon, convertible preferred stock serves as a mechanism that challenges the problem of the incompleteness of contracts.

Finally, given that the design of efficient corporate governance institutions in a VC setting requires a great deal of contracting flexibility, we look at the mandatory nature of European corporate laws and seek to ascertain whether they directly impede VC contracting. Although no such evidence is found, it is argued that the overall mandatory nature of European corporate laws compromises the contract innovation capacity of

European lawyers, who paralyzed by anchoring bias do not invest in learning sophisticated VC financial and corporate governance design techniques that would let the VC industry in Europe flourish.

References

- Aghion Philippe & Bolton Patrick, *An Incomplete Contracts Approach to Financial Contracting*, 59 REVIEW OF ECONOMIC STUDIES 473
- Akerlof George, *The Market for Lemons: Qualitative Uncertainty and the Market Mechanism*, 84 QUARTERLY JOURNAL OF ECONOMICS, 488
- Alanko Mika & Unnérus Jon, *Finland*, in GLOBAL VENTURE CAPITAL TRANSACTIONS (B. BRECHBÜHL & B. WOODER eds., 2004)
- Alchian Armen & Demsetz Harold, *Production, Information Costs and Economic Organization*, 62 AMERICAN ECONOMIC REVIEW 777
- Allen Franklin & Gale Douglas, *Optimal Security Design*, 1 REVIEW OF FINANCIAL STUDIES 229
- Amit Raphael et al., *Entrepreneurial Ability, Venture Investments and Risk Sharing*, 36 MANAGEMENT SCIENCE 1232
- Armour John & Cumming Douglas, *The Legislative Road to Silicon Valley*, 58 OXFORD ECONOMIC PAPERS 596
- Armour John, *Law, Innovation and Finance*, in VENTURE CAPITAL CONTRACTING AND THE VALUATION OF HIGH-TECHNOLOGY FIRMS (J. MCCAHERY & L. RENNEBOOG eds., 2003)
- Arrow Kenneth, *Foreword*, in FIRMS, MARKETS AND HIERARCHIES (G. CARROLL & D. TEECE eds., 1999)
- Arrow Kenneth & Debreu Gerard, *Existence of Equilibrium for a Competitive Economy*, 22 ECONOMETRICA 265
- Atanasov Vladimir et al., *VCs and the Expropriation of Entrepreneurs*, Working Paper 2006, available at SSRN <http://ssrn.com/abstract=905923>
- AYRES IAN, OPTIONAL LAW: THE STRUCTURE OF LEGAL ENTITLEMENTS (2005)

- Ayres Ian & Cramton Peter, *Relational Investing and Agency Theory*, 15 CARDOZO LAW REVIEW 1033
- BAIRD DOUGLAS, GERTNER ROBERT & PICKER RANDAL, *GAME THEORY AND THE LAW* (1994)
- BARNARD CHESTER, *THE FUNCTIONS OF THE EXECUTIVE* (1938)
- Baron David, *Default Risk and the Modigliani-Miller Theorem: A Synthesis*, 64 ECONOMIC REVIEW 204
- Baron David, *Default Risk, Home-Made Leverage and the Modigliani-Miller Theorem*, 62 AMERICAN ECONOMIC REVIEW 176
- Baron James, *The Employment Relation as a Social Relation*, 2 JOURNAL OF THE JAPANESE AND INTERNATIONAL ECONOMIES 492
- BARON JAMES & KREPS DAVID, *STRATEGIC HUMAN RESOURCES* (1999)
- BARTLETT JOSEPH ET AL., *ADVANCED PRIVATE EQUITY TERM SHEETS AND SERIES A DOCUMENTS* (2003)
- BARTLETT JOSEPH, *VENTURE CAPITAL: LAW, BUSINESS STRATEGIES, AND INVESTMENT PLANNING* (1988)
- Bascha Andreas & Walz Uwe, *Financing Practices in the German Venture Capital Industry: An Empirical Assessment*, Working Paper No. 2002/08 Center For Financial Studies, Frankfurt, available at <http://www.altassets.com/pdfs/financing-practices18-9-02.pdf>
- BASKIN JONATHAN & MIRANTI PAUL, *A HISTORY OF CORPORATE FINANCE* (1999)
- Baums Theodor & Möller Matthias, *Venture Capital: U.S.-Modell und Deutsches Aktienrecht*, in *CORPORATIONS, CAPITAL MARKETS AND BUSINESS IN THE LAW. LIBER AMICORUM RICHARD M. BUXBAUM* (T. BAUMS ET AL., eds., 2000)
- Bebchuk Lucian, Kraakman Reinier & Triantis George, *Stock Pyramids, Cross-Ownership and Dual Class Equity: The Mechanisms and Agency Costs of Separating Control From Cash-Flow Rights* in *CONCENTRATED CORPORATE OWNERSHIP* (R. MOCK ed., 1999)
- Becker Gary & Stigler George, *Law enforcement, malfeasance, and the compensation of enforcers*, 3 JOURNAL OF LEGAL STUDIES 1
- Belcher Alice, *The Boundaries of the Firm: The Theories of Coase, Knight and Weitzman*, 17 LEGAL STUDIES 22

- Bengtsson Ola & Sensoy Berk, *Investor Abilities and Financial Contracting: Evidence from Venture Capital*, Working Paper (March 17, 2009), available at SSRN <http://ssrn.com/abstract=1240844>
- BERLE ADOLPH & MEANS GARDINER, *THE MODERN CORPORATION AND PRIVATE PROPERTY* (1932)
- Berndt Markus, *Global Differences in Corporate Governance Systems*, in *ÖKONOMISCHE ANALYSE DES RECHTS* (P. BEHRENS ET AL., eds., 2002)
- Black Bernard & Gilson Ronald, *Venture Capital and the Structure of Capital Markets: Banks versus Stock Markets*, 47 *JOURNAL OF FINANCIAL ECONOMICS* 243
- Black Fischer & Scholes Myron, *The Pricing of Options and Corporate Liabilities*, 81 *JOURNAL OF POLITICAL ECONOMY* 637
- BLAUG MARK, *THE METHODOLOGY OF ECONOMICS- OR HOW ECONOMISTS EXPLAIN* (1992)
- Blazenko George, *Managerial Preference, Asymmetric Information, and Financial Structure*, 42 *JOURNAL OF FINANCE* 839
- BOLTON PATRICK & DEWATRIPONT MATHIAS, *CONTRACT THEORY* (2005)
- Bolton Patrick & Faure-Grimaud Antoine, *Satisficing Contracts*, NBER Working Paper No. 14654 available at <http://www.nber.org/papers/w14654>
- Bolton Patrick & Scharfstein David, *A Theory of Predation Based on Agency Problems in Financial Contracting*, 80 *AMERICAN ECONOMIC REVIEW* 94
- Boot Arnoud & Thakor Anjan, *Security Design*, 48 *JOURNAL OF FINANCE* 1349
- Bratton William, *Venture Capital on the Downside: Preferred Stock and Corporate Control*, in *VENTURE CAPITAL CONTRACTING AND THE VALUATION OF HIGH-TECHNOLOGY FIRMS* (J. McCAHERY & L. RENNEBOOG eds., 2003)
- Brick Ivan et al., *Asymmetric Information Concerning the Variance of Cash Flows: The Capital Structure Choice*, 39 *INTERNATIONAL ECONOMIC REVIEW* 745
- Brousseau Eric & Gachant Jean-Michel, *The Economics of Contracts and the Renewal of Economics*, in *THE ECONOMICS OF CONTRACTS: THEORIES AND APPLICATIONS* (E. BROUSSEAU & J.-M. GACHANT eds., 2002)
- Brouwer Maria & Hendrix Bart, *Two Worlds of Venture Capital: What Happened to U.S. and Dutch Early Stage Investment?*, 10 *SMALL BUSINESS ECONOMICS* 333
- BRUNER ROBERT, *APPLIED MERGERS & ACQUISITIONS* (2004)

- Bruton Garry et al., *Institutional Influences on the Worldwide Expansion of Venture Capital*, 29 ENTREPRENEURSHIP THEORY AND PRACTICE 737
- Buettner Thiesset al., *Taxation and Capital Structure Choice – Evidence from a Panel of German Multinationals*, ZEW Discussion Paper No. 06-067, available at SSRN <http://ssrn.com/abstract=935219>
- Buxbaum Richard, *Facilitative and Mandatory Rules in the Corporation Law(s) of the United States*, 50 THE AMERICAN JOURNAL OF COMPARATIVE LAW 249
- BYGRAVE WILLIAM & TIMMONS JEFFRY, *VENTURE CAPITAL AT THE CROSSROADS* (1992)
- CALAMOS NICK, *CONVERTIBLE ARBITRAGE* (2003)
- CAMP JUSTIN, *VENTURE CAPITAL DUE DILIGENCE: A GUIDE TO MAKING SMART INVESTMENT CHOICES AND INCREASING YOUR PORTFOLIO RETURNS* (2002)
- Campbell Tim & Kracaw William, *Information Production, Market Signaling, and the Theory of Financial Intermediation*, 35 JOURNAL OF FINANCE 863
- Carry William, *Federalism and Corporate Law: Reflections upon Delaware*, 83 YALE LAW JOURNAL 663
- Chan Yuk-Shee , *On the Positive Role of Financial Intermediation in Allocation of Venture Capital in a Market with Imperfect Information*, 38 JOURNAL OF FINANCE 1543
- Chang Chun & Qiu Huiyan, *On the Popularity of and a Comparison of Convertible Preferred and Participating Preferred Equities in Venture Financing*, Working Paper (November 14, 2003) available at SSRN: <http://ssrn.com/abstract=537844>
- Choi Albert & Triantis George, *Strategic Vagueness: The Case of Material Adverse Change (MAC) Clauses*, YALE LAW JOURNAL (forthcoming) (on file with author)
- Coase Ronald, *The Nature of the Firm*, 16 ECONOMICA 386
- Coffee John , *The Mandatory/Enabling Balance in Corporate Law: An Essay on the Judicial Role*, 89 COLUMBIA LAW REVIEW 1618
- Cornelius Barbara, *The Institutionalisation of Venture Capital*, 25 TECHNOVATION 59
- Cornelli Francesca & Yosha Oved, *Stage Financing and the Role of Convertible Securities*, 70 REVIEW OF ECONOMIC STUDIES 1

- Cumming Douglas, *The Convertible Preferred Equity Puzzle in Canadian Venture Capital Finance*, Working Paper-Univ. of Alberta (2000), available at <http://jobfunctions.bnet.com/abstract.aspx?docid=69658>
- Cumming Douglas et al., *Legality and Venture Capital Exits*, 12 JOURNAL OF CORPORATE FINANCE 214
- Cumming Douglas et al., *Legality and Venture Governance around the World*, JOURNAL OF BUSINESS VENTURING (forthcoming), available at http://www.cfainstitute.cn/foundation/pdf/2006em_cumming.pdf
- Cumming Douglas, *Contracts and Exits in Venture Capital Finance*, 21 REVIEW OF FINANCIAL STUDIES 1947
- Cumming Douglas, *United States Venture Capital Financial Contracting: Evidence from Investments in Foreign Securities*, in ADVANCES IN FINANCIAL ECONOMICS, vol. 12 (M. HIRSCHHEY ed., 2007)
- CUMMING DOUGLAS & JOHAN SOFIA, VENTURE CAPITAL AND PRIVATE EQUITY CONTRACTING (2009)
- Da Rin Marco et al., *The Law and Finance of Venture Capital Financing in Europe: Findings from the Ricafé Research Project*, 7 EUROPEAN BUSINESS ORGANIZATION LAW REVIEW 525
- De Schrijver Steven, *Belgium*, in GLOBAL VENTURE CAPITAL TRANSACTIONS (B. BRECHBÜHL & B. WOODER eds., 2004)
- Deci Edward, *Effects of Externally Mediated Rewards on Intrinsic motivation*, 18 JOURNAL OF PERSONALITY AND SOCIAL PSYCHOLOGY 105
- Delfgaauw Josse & Dur Robert, *Signaling and Screening of Workers' Motivation*, 62 JOURNAL OF ECONOMIC BEHAVIOR AND ORGANIZATION 604
- Denis David, *Entrepreneurial Finance: An Overview of the Issues and Evidence*, 10 JOURNAL OF CORPORATE FINANCE 301
- Dessein Wouter, *Information and Control in Alliances and Ventures*, 60 JOURNAL OF FINANCE 2513
- Dewatripont Mathias & Maskin Eric, *Credit and Efficiency in Centralized and Decentralized Economies*, 62 REVIEW OF ECONOMIC STUDIES 541
- Dewatripont Mathias & Roland Gerard, *Soft Budget Constraints, Transition, and Financial Systems*, 156 JOURNAL OF INSTITUTIONAL AND THEORETICAL ECONOMICS 245

- Dewatripont Mathias & Tirole Jean, *A Theory of Debt and Equity: Diversity of Securities and Manager-Shareholder Congruence*, 109 QUARTERLY JOURNAL OF ECONOMICS 1027
- Diamond Douglas, *Financial Intermediation and Delegated Monitoring*, 51 REVIEW OF ECONOMIC STUDIES 393
- DiMaggio Paul & Powel Walter, *The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields*, 48 AMERICAN SOCIOLOGICAL REVIEW 147
- DIXIT AVINASH, THE MAKING OF ECONOMIC POLICY (1996)
- Dixit Avinash & Pyndick Robert, *The Options Approach to Capital Investment*, 73(3) HARVARD BUSINESS REVIEW 105
- Douglas-Hamilton Margaret, *Creditor Liabilities Resulting from Improper Interference with the Management of a Financially Troubled Debtor*, 31 BUSINESS LAWYER 343
- Edwards Ronald, *The Pricing of Manufactured Products*, 19 ECONOMICA 298
- Eisenberg Melvin, *The Conception that the Corporation Is a Nexus of Contracts, and the Dual Nature of the Firm*, 24 JOURNAL OF CORPORATION LAW 819
- Eisenhardt Kathleen, *Agency Theory: An Assessment and Review*, 14 ACADEMY OF MANAGEMENT REVIEW 57
- Enriques Luca & Macey Jonathan, *Creditors versus Capital Formation: The Case against the European Legal Capital Rules*, 86 CORNELL LAW REVIEW 1165
- Falk Armin, Gächter Simon & Kovacs Judit, *Intrinsic Motivation and Extrinsic Incentives in a Repeated Game with Incomplete Contracts*, 20 JOURNAL OF ECONOMIC PSYCHOLOGY 251
- Fama Eugene & Jensen Michael, *Separation of Ownership and Control*, 26 JOURNAL OF LAW AND ECONOMICS 301
- Fama Eugene & Jensen Michael, *Agency Problems and Residual Claims*, 26 JOURNAL OF LAW & ECONOMICS 327
- FAMA EUGENE & MILLER MERTON, THE THEORY OF FINANCE (1972)
- FERRAN EILIS, COMPANY LAW AND CORPORATE FINANCE (1999)
- Fey Bruno, *Shirking or Work Morale? The Impact of Regulating*, 37 EUROPEAN ECONOMIC REVIEW 1523

- Finnerty John, *Corporate Securities Innovation: An Update*, 12 JOURNAL OF APPLIED FINANCE 21
- Finnerty John, *Financial Engineering in Corporate Finance: An Overview*, 17 FINANCIAL MANAGEMENT 14
- Flood John, *Doing Business: The Management of Uncertainty in Lawyers Work*, 25 LAW AND SOCIETY REVIEW 41
- François Alain&Delvoie Jeroen , *De Wet Corporate Governance in het Licht van het Ruimere Corporate Governance Debat*, in DE WET CORPORATE GOVERNANCE ONT(K)LEED (K. BYTTEBIER, ed., 2004)
- FREIXAS XAVIER & ROCHET JEAN-CHARLES, MICROECONOMICS OF BANKING (1997)
- Fried Jesse& Ganor Mira , *Agency Costs of Venture Capitalist Control in Startups*, 81 NEW YORK UNIVERSITY LAW REVIEW 967
- FRIEDMAN MILTON, ESSAYS IN POSITIVE ECONOMICS (1953)
- FUERST OREN & GEIGER URI, FROM CONCEPT TO WALL STREET: A COMPLETE GUIDE TO ENTREPRENEURSHIP AND VENTURE CAPITAL (2002)
- Gale Douglas & Hellwig Martin , *Incentive Compatible Debt Contracts: The One-Period Problem*, 52 REVIEW OF ECONOMIC STUDIES 647
- Gebhardt Georg, *A Soft Budget Constraint Explanation for the Venture Capital Cycle*, 10 GERMAN ECONOMIC REVIEW 71
- Gebhardt Georg & Schmidt Klaus, *Conditional Allocation of Control Rights in Venture Capital Firms*, CEPR Discussion Paper No. 5758, available at [http://epub.ub.uni-muenchen.de/909/1/Gebhardt-Schmidt\(2006M\).pdf](http://epub.ub.uni-muenchen.de/909/1/Gebhardt-Schmidt(2006M).pdf)
- Gilson Ronald & Whitehead Charles, *Deconstructing Equity: Public Ownership, Agency Costs, and Complete Capital Markets*, 108 COLUMBIA LAW REVIEW 231
- Gilson Ronald & Schizer David, *Understanding Venture Capital Structure: A Tax Explanation for Convertible Preferred Stock*, 116 HARVARD LAW REVIEW 874
- Goedsche Marcus, *Germany*, in GLOBAL VENTURE CAPITAL TRANSACTIONS (B. BRECHBÜHL & B. WOODER eds., 2004)
- Gompers Paul, *Optimal Investment, Monitoring and the Staging of Venture Capital*, 50 JOURNAL OF FINANCE 1461

- Gompers Paul, *Ownership and Control in Entrepreneurial Firms: An Examination of Convertible Securities in Venture Capital Investments*, unpublished manuscript (on file with Harvard Business School Library)
- GOMPERS PAUL & LERNER JOSH, *THE VENTURE CAPITAL CYCLE* (1999)
- Gordon Jeffrey, *The Mandatory Structure of Corporate Law*, 89 COLUMBIA LAW REVIEW 1549
- Gordon Jeffrey, *The Mandatory Structure of Corporate Law*, 89 COLUMBIA LAW REVIEW 1549
- Green Richard, *Investment Incentives, Debt and Warrants*, 13 JOURNAL OF FINANCIAL ECONOMICS 115
- Grossman Sanford, *The Informational Role of Warranties and Private Disclosure about Product Quality*, 24 JOURNAL OF LAW AND ECONOMICS 461
- Grossman Sanford, *The Informational Role of Warranties and Private Disclosure About Product Quality*, 24 JOURNAL OF LAW AND ECONOMICS 461
- Haar Brigitte, *Venture Capital Funding for Biotech Pharmaceutical Companies*, in SPONTANEOUS ORDER, ORGANIZATION AND THE LAW (T. EINHORN ed., 2001)
- HALL ROBERT & HITCH CHARLES, *PRICE THEORY AND BUSINESS BEHAVIOR* (1939)
- Harris Milton & Raviv Artur, *The Role of Games in Security Design*, 8 REVIEW OF FINANCIAL STUDIES 327
- Harris Milton & Raviv Artur, *The Theory of Capital Structure*, 46 JOURNAL OF FINANCE 297
- Harris Milton & Raviv Artur, *Optimal Incentive Contracts with Imperfect Information*, 20 JOURNAL OF ECONOMIC THEORY 231
- Harris Milton & Raviv Artur, *Financial Contracting Theory*, in ADVANCES IN ECONOMIC THEORY: SIXTH WORLD CONGRESS vol. II (J.-J. LAFFONT ed., 1992)
- Harris Milton & Raviv Artur, *Capital Structure and the Informational Role of Debt*, 45 JOURNAL OF FINANCE 321
- HARROCH RICHARD, *START-UP & EMERGING COMPANIES: FINANCING & OPERATING THE SUCCESSFUL BUSINESS* (2000)
- Hart Oliver, *An Economist's Perspective on the Theory of the Firm*, 89 COLUMBIA LAW REVIEW 1757
- Hart Oliver, *Financial Contracting*, 39 JOURNAL OF ECONOMIC LITERATURE 1079

- HART OLIVER, FIRMS, CONTRACTS AND FINANCIAL STRUCTURE (1995)
- Hart Oliver, *Incomplete Contracts and the Theory of the Firm*, 4 JOURNAL OF LAW ECONOMICS AND ORGANIZATION 119
- Hart Oliver & Moore John, *Default and Renegotiation: A Dynamic Model of Debt* 113 QUARTERLY JOURNAL OF ECONOMICS 1
- Hart Oliver & Moore John, *A Theory of Debt Based Upon the Inalienability of Human Capital*, 109 QUARTERLY JOURNAL OF ECONOMICS 841
- Hart Oliver & Moore John, *Property Rights and the Nature of the Firm*, 98 JOURNAL OF POLITICAL ECONOMY 1119
- Hart Oliver, *Incomplete Contracts and the Theory of the Firm*, 4 JOURNAL OF LAW, ECONOMICS AND ORGANIZATION 119
- Hege Ulrich et al., *Determinants of Venture Capital Performance: Europe and the United States*, LSE Working Paper Nov. 2003, 2 available at <http://www.lse.ac.uk/collections/RICAFE/pdf/RICAFE-WP01-Hege.pdf>
- Hege Ulrich et al., *Venture Capital Performance: The Disparity between Europe and the United States*, Working paper (February 8, 2008) available at <http://ssrn.com/abstract=482322>
- Heinkel Robert, *A Theory of Capital Structure Relevance under Imperfect information*, 37 JOURNAL OF FINANCE 1141
- Hellmann Thomas, *Financial Structure and Control in Venture Capital*, Chapter 2 from PhD dissertation, available at <http://strategy.sauder.ubc.ca/hellmann/pdfs/>
- Hellmann Thomas, *The Allocation of Control Rights in Venture Capital Contracts*, 29 RAND JOURNAL OF ECONOMICS 57
- Hellmann Thomas & Puri Maju, *Venture Capital and the Professionalization of Start-up Firms: Empirical Evidence*, 57 JOURNAL OF FINANCE 169
- Hellwig Martin, *Bankruptcy, Limited Liability and the Modigliani-Miller Theorem*, 71 AMERICAN ECONOMIC REVIEW 155
- Hellwig Martin, *A Reconsideration of the Jensen-Meckling Model of Outside Finance*, MPI Collective Goods Preprint No. 2007/8, 2. Available at SSRN: <http://ssrn.com/abstract=991079>

- Hiraki Takato, *Corporate Governance, Long-Term Investment Orientation, and Real Options in Japan*, in *REAL OPTIONS IN CAPITAL INVESTMENT: MODELS, STRATEGIES AND APPLICATIONS* (L. TRIGEORGIS ed., 1995)
- Hirshleifer David & Thakor Anjan, *Managerial Conservatism, Project Choice and Debt*, 5 *REVIEW OF FINANCIAL STUDIES* 437
- Homstrom Bengt, *Moral Hazard and Observability*, 10 *BELL JOURNAL OF ECONOMICS* 74
- Hsu Yao-Wen, *Staging of Venture Capital Investment: A Real Options Analysis*, EFMA 2002 London Meetings, 1 available at <http://ssrn.com/abstract=312012>
- Hubbard Glenn, *Capital Market Imperfections and Investment*, 36 *JOURNAL OF ECONOMIC LITERATURE* 193
- Ippolito Filippo, *Convertible Preferred Stock in Venture Capital Financing*, Oxford Financial Research Center Working Paper (September 18, 2007), available at http://www.finance.ox.ac.uk/file_links/finecon_papers/2005fe12.pdf
- JACKSON HOWELL & SYMONS EDWARD, *REGULATION OF FINANCIAL INSTITUTIONS* (1999)
- Jeng Leslie & Wells Phillippe, *The Determinants of Venture Capital Funding: Evidence across Countries*, 6 *JOURNAL OF CORPORATE FINANCE* 241
- Jensen Michael, *Active Investors, LBOs and the Privatization of Bankruptcy*, 2 *JOURNAL OF APPLIED CORPORATE FINANCE* 35
- Jensen Michael, *Organization Theory and Methodology*, 53 *ACCOUNTING REVIEW* 319
- Jensen Michael & Meckling William, *Rights and Production Functions: An Application to Labor-Managed Firms and Codetermination*, 52 *JOURNAL OF BUSINESS* 469
- Jensen Michael & Meckling William, *The Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure*, 3 *JOURNAL OF FINANCIAL ECONOMICS* 305
- Jensen Michael & Smith Clifford, *Stockholder, Manager and Creditor Interests: Applications of Agency Theory*, in *RECENT ADVANCES IN CORPORATE FINANCE* (E. ALTMAN & M. SUBRAHMANYAM eds., 1985)
- Jensen Michael, *Agency Costs of Free Cash Flow, Corporate Finance and Takeovers*, 76 *AMERICAN ECONOMIC REVIEW* 323
- Jensen Michael, *Eclipse of the Public Corporation*, 67 *HARVARD BUSINESS REVIEW* 61
- Jolls Christine et al., *A Behavioral Approach to Law and Economics*, in *BEHAVIORAL LAW & ECONOMICS* (C. SUNSTEIN, ed. 2000)

- JUNG-SENSSEFELDER KAROLINE, EQUITY FINANCING AND COVENANTS IN VENTURE CAPITAL: AN AUGMENTED CONTRACTING APPROACH TO OPTIMAL GERMAN CONTRACT DESIGN (2006)
- Kahan Marcel & Klausner Michael, *Standardization and Innovation in Corporate Contracting (or "The Economics of Boilerplate")*, 83 VIRGINIA LAW REVIEW 713
- Kahan Marchel & Klausner Michael, *Path Dependence in Corporate Contracting: Increasing Returns, Herd Behavior and Cognitive Biases*, 74 WASHINGTON UNIVERSITY LAW QUARTERLY 347
- Kaplan Steven, *What are Firms? Evolution from Birth to Public Companies*, Center for Research in Security Prices, Working Paper No. 603 (2005), 24, available at SSRN <http://ssrn.com/abstract=657721>
- Kaplan Steven & Strömberg Per, *Financial Contracting Theory Meets the Real World: An Empirical Analysis of Venture Capital Contracts*, 69 REVIEW OF ECONOMIC STUDIES 1
- Kaplan Steven & Strömberg Per, *Characteristics, Contracts and Actions: Evidence from Venture Capitalist Analyses*, 59 JOURNAL OF FINANCE 2177
- Kaplan Steven et al., *How Do Legal Differences and Learning Affect Financial Contracts?*, Working Paper (June 2004) available at SSRN <http://ssrn.com/abstract=557007>
- Kaplan Steven, *Bargaining Power: Effective Venture Capital Contracts Come in Many Forms*, CAPITAL IDEAS (May 2004) [summary of the research conducted by Kaplan Steven & Strömberg Per, *Financial Contracting meets the Real World*, published at <http://www.chicagogsb.edu/capideas/may04/contracts.html>]
- Kaplan Steven & Strömberg Per, *Venture Capitalists as Principals: Contracting, Screening and Monitoring*, 91 AMERICAN ECONOMIC REVIEW 426
- Katzin Jerome, *Financial and Legal Problems in the Use of Convertible Securities*, 24 BUSINESS LAWYER 359
- Kester Carl, *Today's options for tomorrow's growth*, 62(2) HARVARD BUSINESS REVIEW 153
- Kirilenko Andrei, *Valuation and Control in Venture Finance*, 56 JOURNAL OF FINANCE 565
- Klausner Michael & Litvak Kate, *What Economists Have Taught Us About Venture Capital Contracting*, in BRIDGING THE ENTREPRENEURIAL FINANCING GAP: LINKING GOVERNANCE WITH REGULATORY POLICY (M. WHINCOP, ed., 2001)
- Klein Benjamin et al., *Vertical Integration, Appropriable Rents and the Competitive Contracting Process*, 21 JOURNAL OF LAW AND ECONOMICS 297

- Klein Linda et al., *Debt vs. Equity and Asymmetric Information: A Review*, 37 FINANCIAL REVIEW 317
- KOESTER ERIC, WHAT EVERY ENGINEER SHOULD KNOW ABOUT STARTING A HIGH-TECH BUSINESS VENTURE (2009)
- Kornai Janos et al., *Understanding the Soft Budget Constraint*, 41 JOURNAL OF ECONOMIC LITERATURE 1095
- Kornai Janos, *The Soft Budget Constraint*, 39 KYKLOS 3
- Kose John, *Risk-shifting Incentives and Signaling through Corporate Capital Structure*, 42 JOURNAL OF FINANCE 623
- Kraus Alan & Litzenberger Robert, *Market Equilibrium in a Multiperiod State Preference Model with Logarithmic Utility*, 30 JOURNAL OF FINANCE 1213
- Krohmer Philipp , *The Liquidation Dilemma of Money Losing Investments - The Impact of Investment Experience and Window Dressing of Private Equity and Venture Capital Funds*, December 2007, available at SSRN: <http://ssrn.com/abstract=1071671>
- La Porta Rafael et al., *Law and Finance*, 106 JOURNAL OF POLITICAL ECONOMY 1113
- Lam Swee-Sum, *Venture Capital Financing: A Conceptual Framework*, 18 JOURNAL OF BUSINESS, FINANCE & ACCOUNTING 137
- Lazear Edward, *Performance Pay and Productivity*, 90 AMERICAN ECONOMIC REVIEW 1346
- Lee Hei Wai & Figlewicz Raymond, *Characteristic of Firms that Issue Convertible Debt versus Convertible Preferred Stock*, 39 QUARTERLY REVIEW OF ECONOMICS AND FINANCE 547
- Leland Hayne & Pyle David, *Informational Asymmetries, Financial Structure and Financial Intermediation*, 32 JOURNAL OF FINANCE 371
- Leland Hayne, *Optimal Risk Sharing and the Leasing of Natural resources with Application to Oil and Gas Leasing on the OCS*, 92 QUARTERLY JOURNAL OF ECONOMICS 413
- Lenoble Jacques, *From an Incentive to a Reflexive Approach to Corporate Governance*, in CORPORATE GOVERNANCE: AN INSTITUTIONALIST APPROACH (2003)
- Lerner Josh & Schoar Antoinette, *Transaction Structures in the Developing World: Evidence from Private Equity*, MIT Sloan Working Paper No. 4468-04 (2004), available at SSRN <http://ssrn.com/abstract=511202>

- Lerner Josh, *The Importance of Patent Scope: An Empirical Analysis*, 25 RAND JOURNAL OF ECONOMICS 319
- Lerner Josh, *Venture Capitalists and the Oversight of Private Firms*, 50 JOURNAL OF FINANCE 301
- Licht Amir, *Cross-Listing and Corporate Governance: Bonding or Avoiding?*, 4 CHICAGO JOURNAL OF INTERNATIONAL LAW 141
- Litvak Kate, *Venture Capital Limited Partnership Agreements: Understanding Compensation Arrangements*, U OF TEXAS LAW AND ECONOMICS RESEARCH PAPER NO. 29; COLUMBIA LAW AND ECONOMICS WORKING PAPER NO. 254, available at SSRN: <http://ssrn.com/abstract=555626>
- Lloyd-Davies Peter, *Optimal Financial Policy in Imperfect Markets*, 10 JOURNAL OF FINANCIAL AND QUANTITATIVE ANALYSIS 457
- Mann Richard, *Starting from Scratch: A Lawyer's Guide to Representing a Startup Company*, 56 ARKANSAS LAW REVIEW 773
- MARSCHAK JACOB & RADNER ROY, ECONOMIC THEORY OF TEAMS (1972)
- MAS-COLELL ANDREU ET AL., MICROECONOMIC THEORY (1995)
- Maskin Eric, *Roy Radner and Incentive Theory*, 6 REVIEW OF ECONOMIC DESIGN 311
- Mauer David & Sarkar Sudipto, *Real Options, Agency Conflicts and Optimal Capital Structure*, 29 JOURNAL OF BANKING AND FINANCE 1405
- McBarnet Doreen, *Law and Capital: The Role of Legal Form and Legal Actors*, 12 INTERNATIONAL JOURNAL OF THE SOCIOLOGY OF LAW 231
- McCahery Joseph & Renneboog Luc, *Venture Capital Financing of Innovative Firms: An Introduction*, in VENTURE CAPITAL CONTRACTING AND THE VALUATION OF HIGH-TECHNOLOGY FIRMS (J. MCCAHERY & L. RENNEBOOG eds., 2003)
- McConnell John & Schwartz Eduardo, *The Origin of LYONs: A Case Study in Financial Innovation*, 4 JOURNAL OF APPLIED CORPORATE FINANCE 40
- Merkt Hanno, *Zur Entwicklung des Deutschen Börsenrechts von den Anfängen bis zum Zweiten Finanzmarktförderungsgesetz*, in EINE ÖKONOMISCHE, RECHTSVERGLEICHENDE UND RECHTSPOLITISCHE UNTERSUCHUNG (K.HOPT & B. RUDOLPH eds., 1997)
- Milgrom Paul, *Good News and Bad News: Representation Theorems and Applications*, 12 BELL JOURNAL OF ECONOMICS 380

- Milhaupt Curtis, *The Market for Innovation in the United States and Japan: Venture Capital and the Comparative Corporate Governance Debate*, 91 NORTHWESTERN UNIVERSITY LAW REVIEW 865
- Miller Edwin et al., *Venture Capital Financings of Technology Companies*, Waltham, MA: Morse, Barnes-Brown & Pendleton, P.C. 2002, available at http://www.mbbp.com/resources/business/pdfs/vc_financings_tech.pdf.
- Modigliani Franco & Miller Merton, *Corporate Income Taxes and the Cost of Capital: A Correction* 53 AMERICAN ECONOMIC REVIEW 433
- Modigliani Franco & Miller Merton, *The Cost of Capital, Corporation Finance and the Theory of Investment*, 48 AMERICAN ECONOMIC REVIEW 261
- Mukerji Sujoy, *Ambiguity Aversion and Incompleteness of Contractual Form*, 88 AMERICAN ECONOMIC REVIEW 1207
- Myers Stewart & Majluf Nicholas, *Corporate Financing and Investment Decisions when Firms Have Information that Investors Do Not Have*, 13 JOURNAL OF FINANCIAL ECONOMICS 187
- Myers Stewart, *Determinants of Corporate Borrowing*, 5 JOURNAL OF FINANCIAL ECONOMICS 147
- Neuchterlein Jeffrey, *International Venture Capital: The Role for Start-up Financing in the United States, Europe and Asia*, in ECONOMIC STRATEGY AND NATIONAL SECURITY: A NEXT GENERATION APPROACH (P. DESOUZA ed., 2000)
- New Instruments Standing Committee (Moody's Investors Service), *Rating Methodology. Moody's Tool Kit: A Framework for Assessing Hybrid Securities* (Dec. 1999), reproduced in BALANCE SHEET STRUCTURES (A. BIRTS ed.) (2001)
- Okuno-Fujiwara Masahiro et al., *Strategic Information Revelation*, 57 REVIEW OF ECONOMIC STUDIES 25
- Paredes Troy, *A Systems Approach to Corporate Governance Reform: Why Importing U.S. Corporate Law isn't the Answer*, 45 WILLIAM & MARY LAW REVIEW 1055
- PETER SPENCER, *THE STRUCTURE AND REGULATION OF FINANCIAL MARKETS* (2000)
- Pistor Katharina et al., *Innovation in Corporate Law*, 31 JOURNAL OF COMPARATIVE ECONOMICS 676
- Pistor Katharina et al., *The Evolution of Corporate Law: A Cross-Country Comparison*, 23 UNIVERSITY OF PENNSYLVANIA JOURNAL OF INTERNATIONAL ECONOMIC LAW 791

- Polito Anthony, *A Modest Proposal Regarding Debt-like Preferred Stock*, 20 VIRGINIA TAX REVIEW 291
- POULTON EUSTACE, BEHAVIORAL DECISION THEORY: A NEW APPROACH (1994)
- Powell Michael, *Professional Innovation: Corporate Lawyers and Private Lawmaking*, 18 LAW & SOCIAL INQUIRY 423
- Pradipkumar Ramanial et al., *A Simple Approximation of the Value of Callable Convertible Preferred Stock*, 25 FINANCIAL MANAGEMENT 74
- Pukthuanthong Kuntara et al., *Why Venture Capital Markets are Well Developed in Some Countries but Comparatively Small in Others: Evidence from Europe*, in VENTURE CAPITAL IN EUROPE (G. GREGORIOU ET AL. eds., 2007)
- RASMUSEN ERIC, GAMES AND INFORMATION: AN INTRODUCTION TO GAME THEORY (2001)
- RASMUSEN ERIC, GAMES AND INFORMATION: AN INTRODUCTION TO GAME THEORY (2007)
- REID GAVIN, VENTURE CAPITAL INVESTMENT: AN AGENCY ANALYSIS OF PRACTICE (1998)
- Repullo Rafael & Suarez Javier, *Venture Capital Finance: A Security Design Approach*, 8 REVIEW OF FINANCE 75
- Reumkens Hugo, *The Netherlands*, in GLOBAL VENTURE CAPITAL TRANSACTIONS (B. BRECHBÜHL & B. WOODED eds., 2004)
- Roe Mark, *The Institutions of Corporate Governance*, in THE HANDBOOK OF NEW INSTITUTIONAL ECONOMICS (C. MENARD & M. SHIRLEY eds., 2008)
- Roe Mark, *The Shrinking Half-Life of Delaware's Corporate Tax Base*, Working Paper 2009 (on file with author)
- Ross Stephen, *The Economic Theory of Agency: The principal's problem*, 63 AMERICAN ECONOMIC REVIEW 134
- Ross Stephen, *The Determination of Financial Structure: The Incentive Signalling Approach*, 8 BELL JOURNAL OF ECONOMICS 23
- Ruhnka John et al., *The "Living Dead" Phenomenon in Venture Capital Investments*, 7 JOURNAL OF BUSINESS VENTURING 137
- Sabri Nidal Rashid, *Using Treasure "Repurchase" Shares to Stabilize Stock Markets*, 8 INTERNATIONAL JOURNAL OF BUSINESS 426

- Sahlman William, *The Structure and Governance of Venture-Capital Organizations*, 27 JOURNAL OF FINANCIAL ECONOMICS 473
- SALANIE BERNARD, *THE ECONOMICS OF CONTRACTS: A PRIMER* (2005)
- SCHELL JAMES, *PRIVATE EQUITY FUNDS: BUSINESS STRUCTURE AND OPERATIONS* (1999)
- Schmidt Klaus, *Convertible Securities and Venture Capital Finance*, 58 JOURNAL OF FINANCE 1139, 1139
- SCHWEIZER URS, *VERTRAGSTHEORIE* (1999)
- Schwienbacher Armin, *Venture Capital Investment Practices in Europe and in the United States*, 22 FINANCIAL MARKETS AND PORTFOLIO MANAGEMENT 195
- Scott Robert & Triantis George, *Incomplete Contracts and the Theory of Contract Design*, 56 CASE WESTERN RESERVE LAW REVIEW 187
- Shleifer Andrei & Vishny Robert, *A Survey of Corporate Governance*, 52 JOURNAL OF FINANCE 737
- SIMON HERBERT, *ADMINISTRATIVE BEHAVIOR* (1961)
- SKOOG GUN ERIKSSON, *THE SOFT BUDGET CONSTRAINT: THE EMERGENCE, PERSISTENCE AND LOGIC OF AN INSTITUTION* (2000)
- Smit Han & Trigeorgis Lenos, *Real Options: Principles of Valuation and Strategy*, in VENTURE CAPITAL CONTRACTING
- Smith Clifford & Warner Jerold, *On Financial Contracting: An Analysis of Bond Covenants*, 7 JOURNAL OF FINANCIAL ECONOMICS 117
- Standard & Poor's, *Corporate Criteria-Equity Credit: What it is, and How you Get it. Factoring Future Equity into Ratings. Tax Deductible Preferreds and Other Hybrids. A Hierarchy of Hybrid Securities* (2005), 1 (on file with author)
- Stein Jeremy, *Convertible Bonds as Backdoor Equity Financing*, 32 JOURNAL OF FINANCIAL ECONOMICS 3
- Stiglitz Joseph, *On the Irrelevance of Corporate Financial Policy*, 64 AMERICAN ECONOMIC REVIEW 851
- Stiglitz Joseph, *A Re-Examination of the Modigliani-Miller Theorem*, 59 AMERICAN ECONOMIC REVIEW 784

- Stiglitz Joseph, *Information and Economic Analysis: A Perspective*, 95 THE ECONOMIC JOURNAL 21
- Stulz Rene, *Managerial Discretion and Optimal Financing Policies*, 26 JOURNAL OF FINANCIAL ECONOMICS 3
- Temin Peter, *Financial Intermediation in the Early Roman Empire*, 64 JOURNAL OF ECONOMIC HISTORY 705
- Temmel Wolf, *Austria*, in GLOBAL VENTURE CAPITAL TRANSACTIONS (B. BRECHBÜHL & B. WOODER eds., 2004)
- Tiberi Luca, *Italy*, in GLOBAL VENTURE CAPITAL TRANSACTIONS (B. BRECHBÜHL & B. WOODER eds., 2004)
- Tirole Jean, *Corporate Governance*, 69 ECONOMETRICA 1
- Tomlinson Jim, *Democracy Inside the Black Box? Neoclassical Theories of the Firm and Industrial Democracy I*, 15 ECONOMY AND SOCIETY 220
- Townsend Robert, *Optimal Contracts and Competitive Markets with Costly State Verification*, 21 JOURNAL OF ECONOMIC THEORY 265
- Trester Jeffrey, *Venture Capital Contracting under Asymmetric Information*, 22 JOURNAL OF BANKING AND FINANCE 675
- Triantis Alexander & Triantis George, *Conversion Rights and the Design of Financial Contracts*, 72 WASHINGTON UNIVERSITY LAW QUARTERLY 1231
- Triantis George, *Debt Financing, Corporate Decision Making and Security Design*, 26 CANADIAN BUSINESS LAW JOURNAL 93
- Triantis George, *Financial Contract Design in the World of Venture Capital*, 68 UNIVERSITY OF CHICAGO LAW REVIEW 308
- VALRAS LEON, ELEMENTS OF PURE ECONOMICS (W. Jaffe, trans., 1954)
- Veasy Norman, *Should Corporation Law Inform Aspirations of Good Corporate Governance Practices – or Vice Versa?* 149 UNIVERSITY OF PENNSYLVANIA LAW REVIEW 2179
- Vermaelen Theo, *Repurchase Tender Offers, Signalling, and Managerial Incentives*, 19 JOURNAL OF FINANCIAL AND QUANTITATIVE ANALYSIS 163
- VERMEULEN ERIK , THE EVOLUTION OF LEGAL BUSINESS FORMS IN EUROPE AND THE UNITED STATES: VENTURE CAPITAL, JOINT VENTURE AND PARTNERSHIP STRUCTURES (2003)

- Vermeulen Erik, *Towards a New “Company” Structure for High-Tech Start-Ups in Europe*, 29, December 2000 available at SSRN <http://ssrn.com/abstract=255619>
- WALTER ROBERT, *FINANCING YOUR SMALL BUSINESS* (2004)
- Wang Sushen & Zhou Hailan, *Staged Financing in Venture Capital: Moral Hazard and Risks*, 10 JOURNAL OF CORPORATE FINANCE 131
- WEI YUWA, *COMPARATIVE CORPORATE GOVERNANCE: A CHINESE PERSPECTIVE* (2003)
- Whincop Michael, *The Gap into Governance*, in BRIDGING THE ENTREPRENEURIAL FINANCING GAP: LINKING GOVERNANCE WITH REGULATORY POLICY (M. WHINCOP, ed., 2001)
- WICKSELL KNUT, *LECTURES ON POLITICAL ECONOMY*, vol. 1
- Williams Allan et al., *International Labour Mobility and Uneven Regional Development in Europe: Human Capital, Knowledge and Entrepreneurship*, 11 EUROPEAN URBAN AND REGIONAL STUDIES 27
- Williamson Oliver, *Corporate Finance and Corporate Governance*, 48 JOURNAL OF FINANCE 567
- WILLIAMSON OLIVER, *MARKETS AND HIERARCHIES: ANALYSIS AND ANTITRUST IMPLICATIONS* (1975)
- WILLIAMSON OLIVER, *THE ECONOMIC INSTITUTIONS OF CAPITALISM* (1985)
- Williamson Oliver, *The Theory of the Firm as Governance Structure: From Choice to Contract*, 16 JOURNAL OF ECONOMIC PERSPECTIVES, 171
- Williamson Oliver, *Transaction-Cost Economics: The Governance of Contractual Relations*, 22 JOURNAL OF LAW AND ECONOMICS 3;
- Wilson Robert, *The Structure of Incentives for Decentralization under Uncertainty*, in LA DÉCISION: AGGRÉGATION ET DYNAMIQUE DES ORDRES DE PREFERENCE (G. GUILBAUD ed., 1969)
- Woronoff Michael & Rosen Jonathan, *Effective vs. Nominal Valuations in Venture Capital Investing*, 2 NEW YORK UNIVERSITY JOURNAL OF LAW AND BUSINESS 101
- Woronoff Michael & Rosen Jonathan, *Understanding Anti-Dilution Provisions in Convertible Securities*, 74 FORDHAM LAW REVIEW 101
- Yerramilli Vijay, *Joint Control and Redemption Rights in Venture Capital Contracts*, ECGI – Finance Working Paper no. 37/2004, 1 available at SSRN: <http://ssrn.com/abstract=481362>

Zender Jaime, *Optimal Financial Instruments*, 46 JOURNAL OF FINANCE 1645

Zider Bob, *How Venture Capital Works*, HARVARD BUSINESS REVIEW (November-December 1998) 131

Zingales Luigi, *Corporate Governance in* THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW (P. NEWMAN ed., 1998)